Secrets of the Jungle

Published by:

Last Wilderness Foundation
251-B, Kewal Industrial Estate, Senapati Bapat Marg,
Lower Parel (W), Mumbai - 400013

Kalpavriksh
5, Shree Dutta Krupa, 908 Deccan Gymkhana
Pune 411004

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Design and Layout: Tanya Majmudar

First Published: 2016

This Reprint: 2019

ISBN: 978-81-87945-69-7

This book was originally published in Hindi and English by Kalpavriksh and Last Wilderness Foundation in 2016.

Acknowledgements: Bhavna Menon, Kedar Bhide, Meenal Tatpati, Neema Pathak, Rupa Majmudar, Sanjay Sondhi, Shiba Desor, Siddesh Shinde, Sujatha Padmanabhan, Vidya Venkatesh

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My Forest and Me

How often do you go into the forest? What time of the day do you go?

Which wild animal do you see most often?

What do you do in the forest?

Describe the time you saw a wild animal for the first time.

If you had to describe the forest in just three words, what would they be?

Do you like being in the forest? Why?

If a visitor comes to your forest for the first time, what would you show him?

Describe a moment when you were very scared of being in the forest.

Draw a Forest

Draw a forest here. If you haven't been in one, draw what you think it looks like.

Birds

Birds are all around us. Wherever you look, you are likely to see a bird - on a tree, in a pond, flying overhead, even right outside your house! Some are huge, some are small, some are bright and colourful, while some are dull and drab. Some are shy and will fly away if you go too close. Others will sit peacefully and go about their business while you observe them.

Favourite Birds

Have you seen many different kinds of birds around where you live? Do you know their names? Write the names of five of your favourite birds here:

1. _____

2. _____

3. _____

4. _____

5. _____

Did you know?

There are about 9,026 species of birds in the world of which around 1,233 are found in India.

What is a bird?

You might have noticed that birds fly. They have wings for this. But are all flying creatures birds? Not at all! There are butterflies and insects and even mammals that fly. In fact there are lizards and frogs that jump and glide long distances!

Do all birds fly? The answer to that question is "no" as well. There are a few birds that don't. So what is a bird, then? A bird is described as a creature that has two legs and feathers. No other type of animal can fit this description.

Why does a bird have feathers?

This is like asking, "why does a human have hands?" There would be no end to listing their uses! It is the same with birds and feathers.

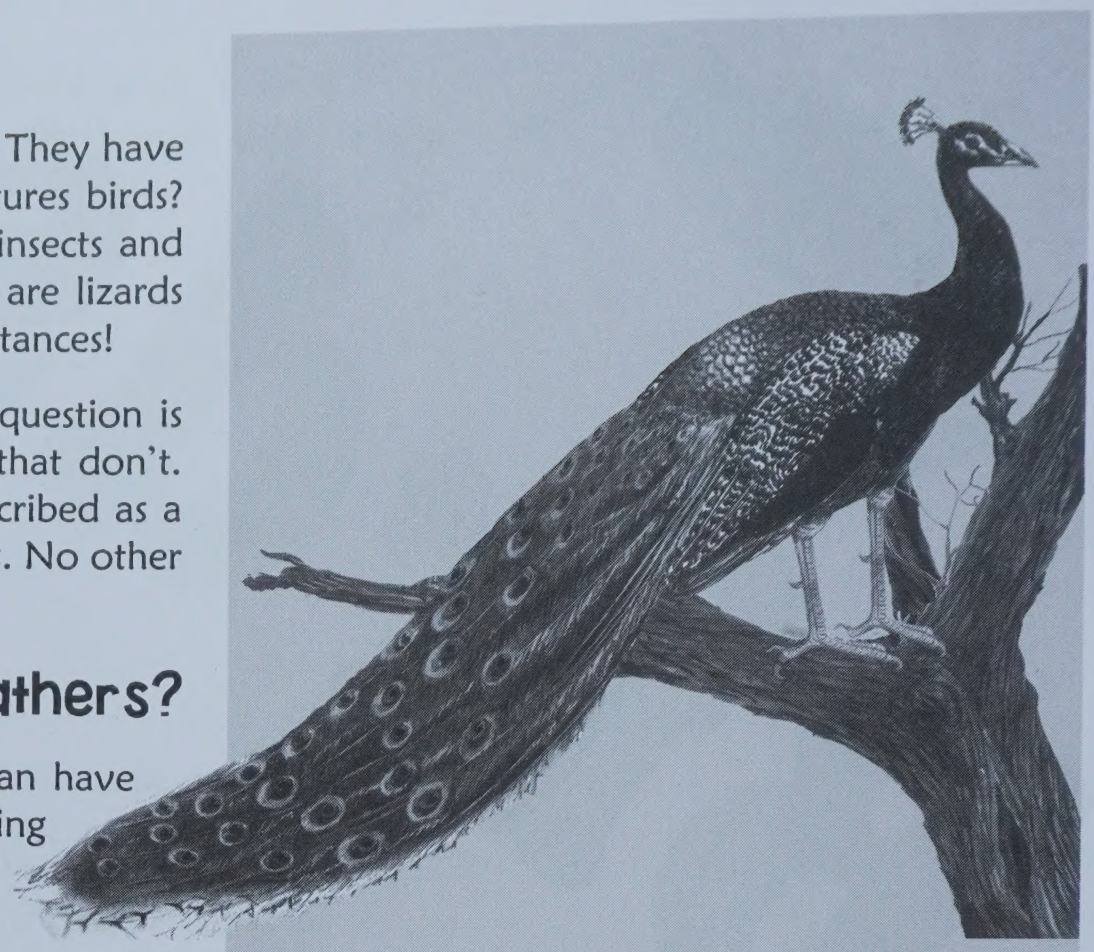
Feathers enable a bird to fly. There are various types of feathers on a bird's body. All of them have a central shaft and barbs on each side. The tail and wing feathers are the ones used for flight. The feathers in the wings separate when the wings move upwards, to allow air to pass through. During downward motion of the wing, the gaps close and the entire wing pushes against the air to lift the bird upwards. The tail provides control during flight. The bird can move its tail to steer itself in air. Because feathers go through a lot of wear and tear, they need to be replaced every now and then. This is why feathers moult.

Feathers also provide birds warmth and protection.

Some birds have bright coloured feathers for courtship display. Males are more colourful in most species. This can be seen very clearly in the peafowl, where the males have beautiful tail feathers. Another bird with extraordinary tail feathers is the Asian paradise flycatcher. Can you think of more?

Did you know?

Some water birds like grebes have a waxy coating on their feathers, which help to make their wings watrerproof!



Peafowl

What does it look like?

The peafowl is a large and colourful bird. The male has a long tail that boasts of vibrant eyespots, with blue, green, gold and a number of other hues. It's body, which is mostly blue, can grow up to 4 ft long and the tail, up to 5 feet! The tail can be displayed in a spectacular fan of brilliant colours. The female is a duller greyish brown and lacks the tail. Both have crests.

What does it eat?

The peafowl is a ground feeders and eats plants, grains, berries, insects, lizards, snakes and small rodents.

Where can I spot it?

It is found in dense forests, open plains and even in the outskirts of cities.

How does it breed?

A peafowl's nest is a shallow scrape in the ground in a dense thicket, surrounded by sticks and leaves. It lays about 3 to 5 eggs at a time.

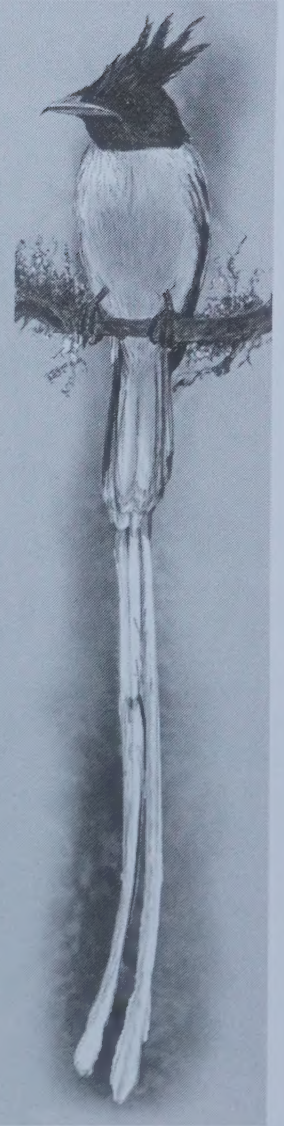
Did you know?

A peafowl is among the largest birds that can fly. It is our national bird.

Asian Paradise Flycatcher

What does it look like?

The Asian paradise flycatcher is unmistakeable due to its long, graceful tail. Though its body is only about 8 inches, its tail can grow up to a foot long! It has a glossy black head, with a crest. In males, the rest of the body is mostly white, while females are rufous and have shorter tails. Young males look very much like females but can be differentiated by their black throats.



What does it eat?

As the name suggests, this bird catches flies and other insects to eat.

Where can I spot it?

You can see it perched high up on a tree. From time to time, you may see it darting out from its perch in order to catch flying insects in mid-air. It can be seen in forests, plantations, in shaded areas and often near water.

How does it breed?

It builds deep, cone-shaped nests on trees. Three to four eggs are laid at a time. Both males and females take part in building nests and feeding the young.

Did you know?

It is the state bird of Madhya Pradesh.

Sometimes, feathers have the same colouring as the natural surroundings of a bird. This helps them conceal themselves from predators. This wonderful technique is called camouflage.

Not all birds use camouflage. In some species, males have bright colours to make them stand out to potential mates. However, some species prefer being protected! Females who are nesting may often be camouflaged. Some birds may use camouflage when they are juveniles. This reduces as they become adults and find other ways to protect themselves against predators. Other types of birds that use camouflage are ones that are active at night. Birds like owls and nightjars are mostly active at night and rest during the day. Hence, they have developed strong camouflage for daytime protection.

Feather Art

Birds shed their feathers. If you look around your house, you might find some fallen on the ground. Collect a few and paint them in different colours. Display these in your classroom. Painted feathers can look very pretty!

Did you know?

Many birds have more colourful feathers in the breeding season. In the non-breeding season, these birds become more drab and hence more protected! Have you seen any birds that look different in a particular season?

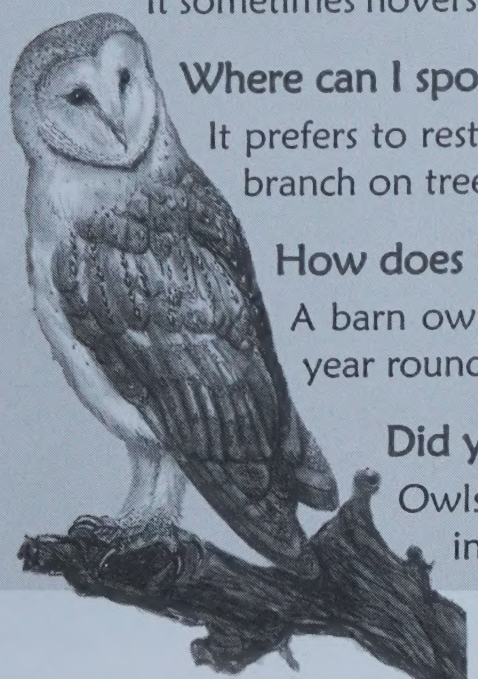
Barn Owl

What does it look like?

A barn owl has a heart-shaped, clear white face with black eyes. The face is quite flat with some feathers giving it the appearance of having a nose. The bird is whitish from the front while the head and back are brownish.

What does it eat?

A barn owl hunts small mammals, reptiles and occasionally, insects. It hunts by twilight or at night. It sometimes hovers a few metres above vegetation and pounces on its prey when it sees it.



Where can I spot it?

It prefers to rest during the day. You can find it in tree hollows or perching on a low branch on trees near farms, in villages in cities and even inside buildings.

How does it breed?

A barn owl makes its nest in tree hollows or in buildings and breeds almost all year round.

Did you know?

Owls can hunt in darkness. They have developed an acute sense of hearing in order to do this. They can detect their prey just by their sounds.

Nightjar

What does it look like?

A nightjar is characterized by its long, pointed wings, short legs and a very short beak. Its plumage is greyish brown, resembling leaves or barks of trees. This helps it blend so well with the surrounding soil that it is hardly detectable during the day.

What does it eat?

A nightjar mostly eats flying insects such as moths, flies, mosquitoes and beetles.

Where can I spot it?

A nightjar is active during late evening, night and early morning. It flies with an easy, silent flight. At dusk, you can spot it near livestock, flying around the animals to catch the insects swarming there. At night, you can sometimes see it near street lamps, where there are a lot of insects. During the day, it can be seen sitting very still on the ground or perched on a low branch. Unlike other birds, it perches along the length of the branch instead of across it. This helps it hide better.

How does it breed?

It usually lays eggs directly on the ground without building a nest.

Did you know?

A nightjar has very short legs, which are of little use for walking. Why do you think it evolved to have such short legs?

How can you identify birds around you?

There are people who are so fond of birds that they travel across the world and spend hours on end trying to spot and identify different species. Do you know how to identify a new bird? There are various things you can observe in order to do this:

A. overall size and shape

B. size and shape of beak

C. size and shape of legs and feet

D. size and shape of wings and tail

E. colour - general colour above and below,
colour of beak, legs, feet, eyes, markings on the body

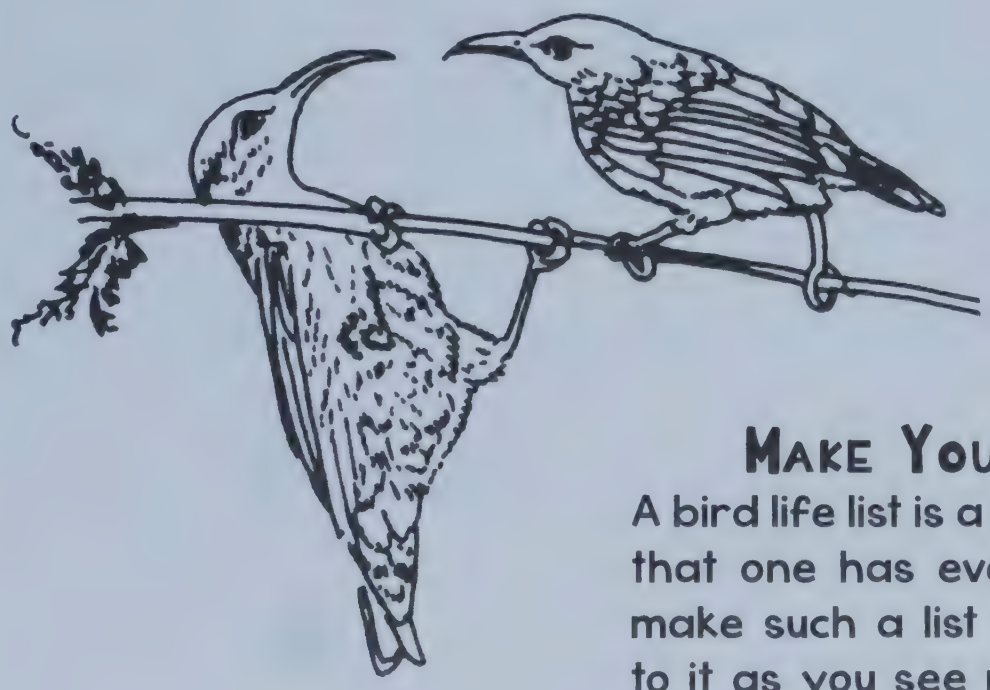
F. actions of flight or gait, behaviour of bird

G. call

H. habitat

I. date, time and place

It is important to remember that birding requires a lot of patience. You have to sit quietly in a hidden spot and wait. You may not be able to make all the above observations immediately. Do not be disheartened! With time, you will be rewarded!



Make Your Very Own Life List

A bird life list is a record of all the species of birds that one has ever seen and identified. You can make such a list in a notebook and keep adding to it as you see more and more birds. You could also add details like when and where you saw the bird. Keeping a life list inspires people to try and see more and more birds. Also, it is a lot of fun!

A. Size

You must have seen both big and small birds. Knowing a bird's size is a very important step in its identification. But how do you measure a bird? Obviously, you can't chase after it with a tape measure! Bird lovers have found a very simple solution. When confronted with a new bird, they simply compare its size to that of a commonly known bird. They may describe a new bird saying, "That bird was bigger than a sparrow but smaller than a bulbul," or "That bird was about as big as a pigeon."

Given below are some common birds whose sizes are used for comparison.

Sparrow	Bulbul	Pigeon	Crow	Kite	Vulture
15 cm	20 cm	33 cm	43 cm	61 cm	91 cm

Size Problem

Imagine you were describing these birds to your friend, who has never seen them. How would you describe their sizes?

Myna _____

Village Hen _____

Partridge _____

Peafowl _____

B. Beaks

Have you closely observed the beaks of birds? Are they all the same? Not at all! Some are long and thin, some are short and stout, some are curved, some have a hook at the end, some are broad, some are blunt and hard, some have a pouch... the list goes on! Why is this the case?

Different birds eat very different foods and over time, their beaks have adapted to suit their special diet. A crested hawk eagle has a strong, hooked beak for tearing the flesh of snakes and rodents that it eats. A kingfisher has a long, broad beak that helps it swoop into a pond and catch fish.

Crested Hawk Eagle

What does it look like?

The crested hawk eagle is quite a regal looking bird! It has broad wings and a long and broad tail. It has a floppy and prominent crest of around four feathers on its head. Overall, it appears light brownish in colour with brown and white streaks along its throat and breast.

What does it eat?

It eats small birds, small mammals as well as lizards.

Where can I spot it?

The crested hawk eagle spends much of the day perched up on a tree, often located at the edge of a clearing. It sits bolt upright, on the lookout for prey that may come out into the open. From here, it swoops down and pounces on its prey on the ground, carrying it away in its talons.

How does it breed?

Its nest is made of sticks and twigs, placed high up on a tree.

Did you know?

Crested hawk eagles are generally silent, except during the breeding season from November to June, when they give a series of shrill whistles *ki-ki-ki-ki-ki-kee-ah*.

Common Kingfisher

What does it look like?

This is a small bird with brilliant colours. It has bright turquoise blue on the back and orange on the underside. It has a large head and a long, flat beak.

What does it eat?

As the name suggests, a kingfisher eats fish. It perches on a branch or bank near the water and sits intently for a long time as it searches for prey. When it detects it, it bobs its head up and down to gauge the distance. It then plunges head first into the water, and catches the prey with its beak. Kingfishers consume about 60% of their body weight in food every day. Imagine how much that would be for a human!

Where can I spot it?

You can find it near rivers, lakes, ponds, streams, canals, ditches – wherever there's water and fishes!

How does it breed?

A kingfisher digs up burrows on sandy banks in order to nest. It lays about six to seven eggs at a time. Kingfishers are territorial birds and fiercely protect their territories.

Did you know?

A kingfisher needs to be able to track the movement of fish under water, after it dives to catch them. It has an additional transparent eyelid, to enable it to do this.

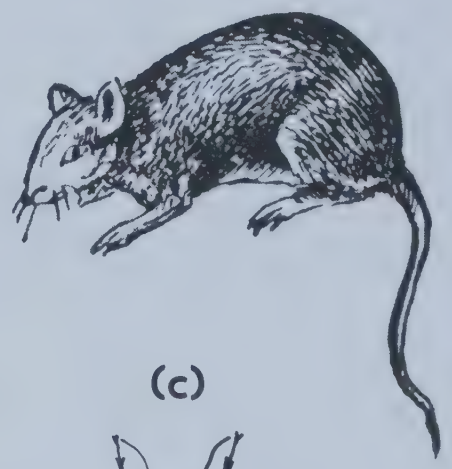
Tricks with Beaks

Look at the beaks of the birds below. Can you guess their diet by looking at their beaks? Tick the correct option in each case, from the three given.

I have a beak that's short and sharp and can easily tear apart flesh. What do you think I eat?

(a)

(b)

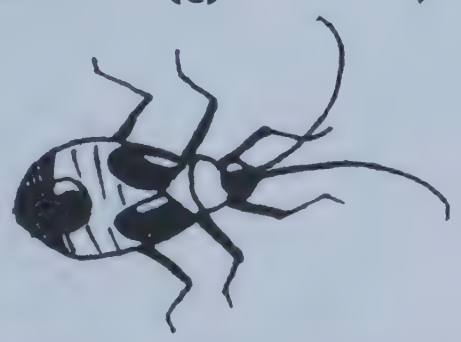


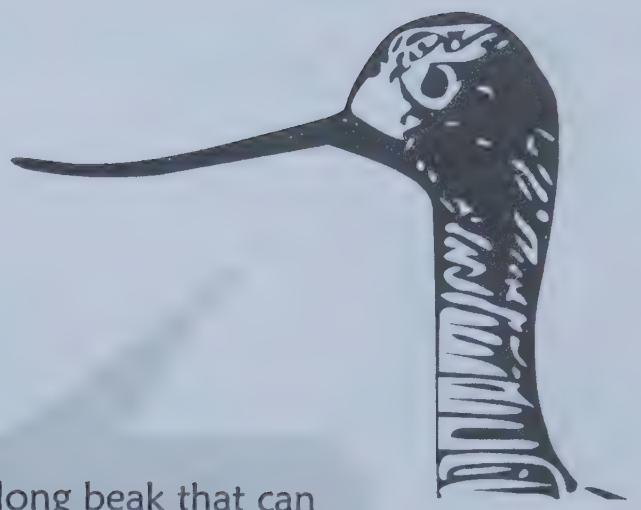
(c)

(a)

(b)

(c)





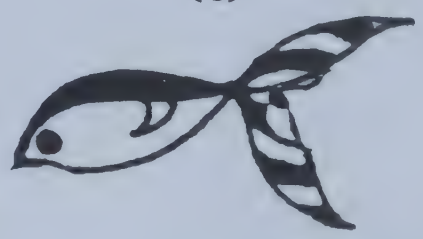
I have a thin, long beak that can reach deep inside mud to pull out what's hiding there. What do you think I eat?

I have a pouch in my beak to scoop up things from the water. What do you think I eat?

(a)

(b)

(c)



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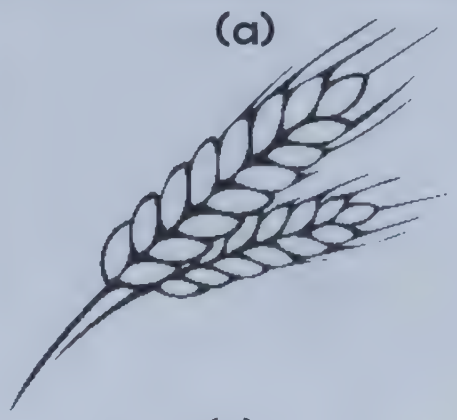

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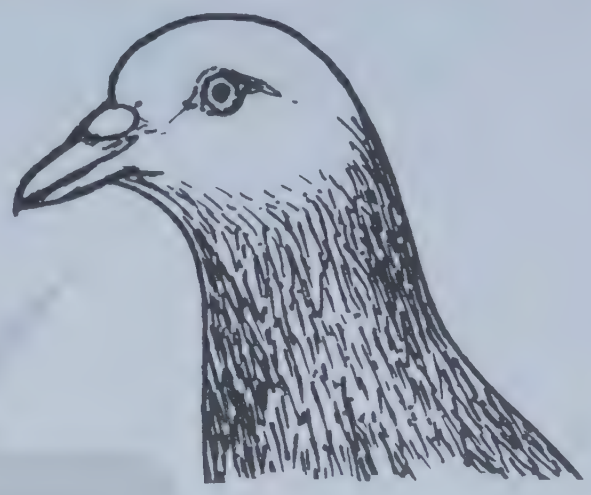
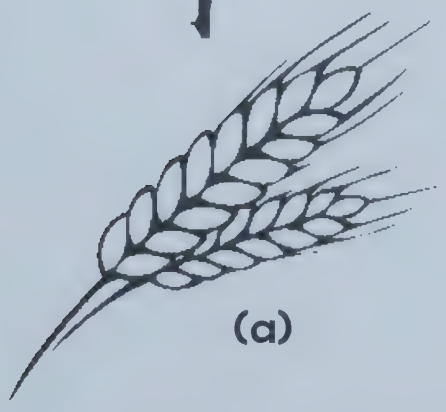


(c)

I have a beak that's thick and strong. I can use it to crush small, hard things. What do you think I eat?

I have a long curved beak to reach inside something and suck juice. What do you think I eat?



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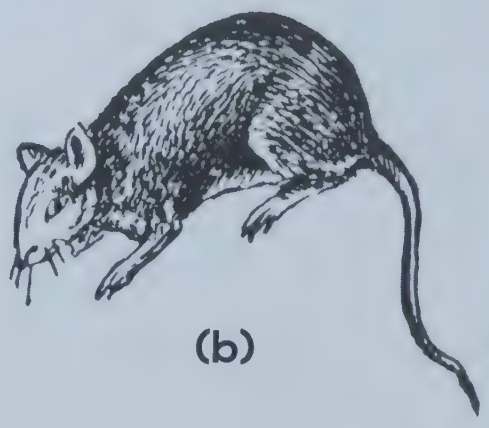

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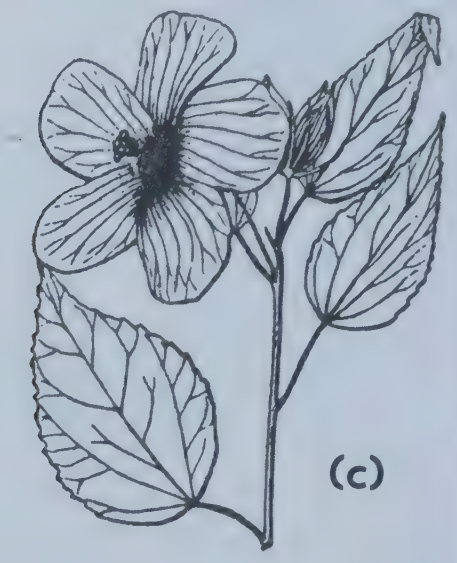
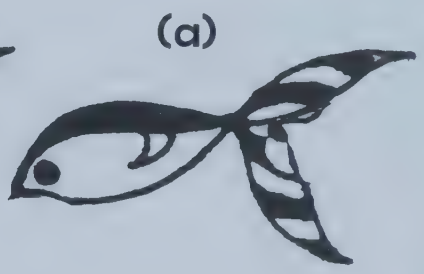


(c)

I have a hard, blunt beak which helps me peck away at wood, to reach what's inside tree trunks. What do you think I eat?



(a)

(b)

(c)

My Beak

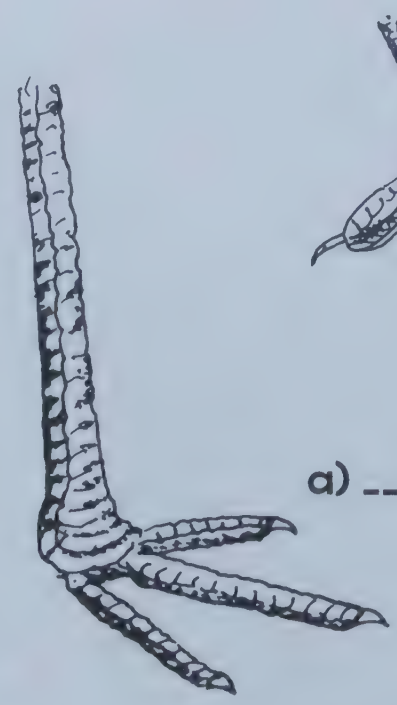
If you were a bird, what would your beak look like? Draw it in the box.

C. Legs and Feet

Just like beaks, the legs and feet of birds have also evolved over the years to perform specific functions.

How Do I Move?

Look at the legs and feet of the birds below. What do you think they are used for? Write down the use of each below the picture. (running, grasping prey, wading near water, perching on a tree, swimming)



a) ----------

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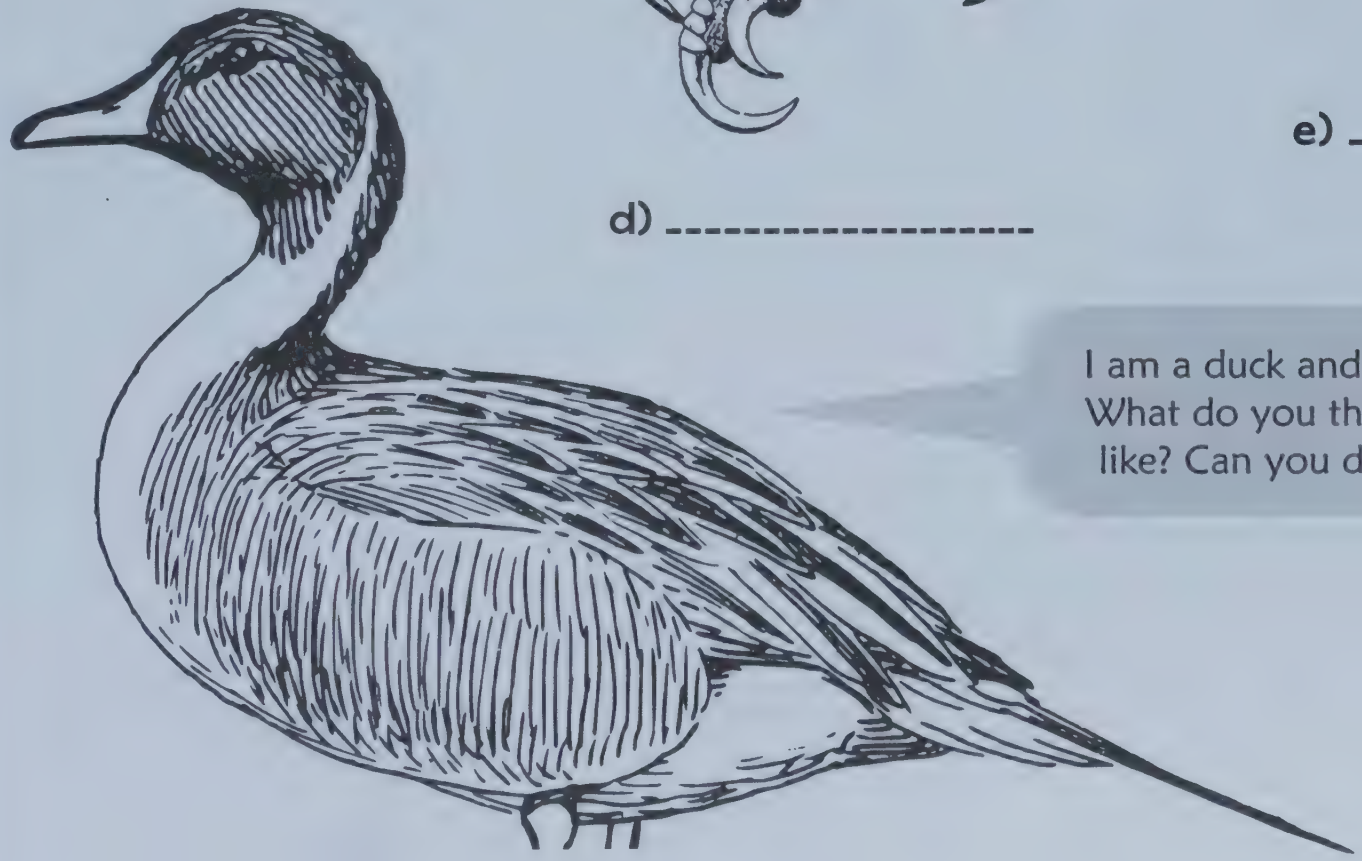


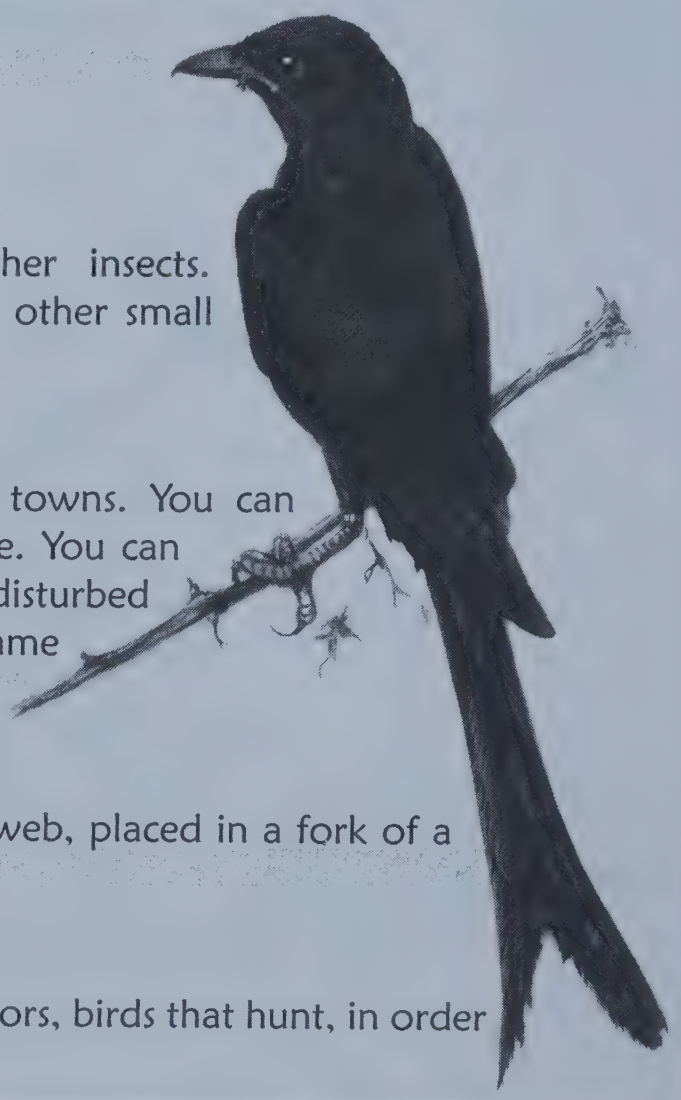
I am a duck and I swim in water. What do you think my feet look like? Can you draw them here?

D. Size and Shape of Wings and Tail

The wings and tails of many birds are quite distinctive and can help you identify them. For instance, eagles and kites make very typical shapes in the sky while flying. Experienced birders are able to identify species just by looking at these shapes!

Some birds have distinctive tails too. An Asian paradise flycatcher can very easily be identified by its long, graceful tail. You might have come across a black bird with a forked tail perched on a tree. That is most likely some kind of a drongo.

Black Drongo



What does it look like?

This is a glossy black bird with a deeply forked tail.

What does it eat?

Black drongos mainly feed on grasshoppers and other insects. Occasionally, they take nectar from flowers and prey on other small birds.

Where can I spot it?

It is found near agricultural fields, outside villages and towns. You can see it perched on a tree, a lamp post or a telephone wire. You can occasionally find it near cattle, since it preys on the insects disturbed by these animals. Forest fires also attract drongos for the same reason.

How does it breed?

Its nest is a cup of fine twigs and fibres, cemented by cobweb, placed in a fork of a tree.

Did you know?

It is said that drongos are tricksters! They mimic calls of raptors, birds that hunt, in order to scare off birds such as mynas to steal their food.

Farmers' Friends

Drongos are considered to be beneficial to agriculture because they eat a number of insects that destroy crops. Do you know of any other creatures that are beneficial to agriculture? Name 2 and say how.

1. _____

2. _____

E. Colours

Colours are the first thing you think of when you think of birds. A golden oriole is a bright golden yellow, while a grey hornbill is a dull grey. Some birds have such distinctive colours, that you can identify them just by a quick glance. However, most species need closer inspection. One needs to note not just the overall colours, but also those of the beak, the wings, the legs and the eyes. A yellow-footed green pigeon is so named for the colour of its feet, and the red-headed vulture for the colour of its head. Some species also have very distinct markings on the body. For instance, the painted sandgrouse can be identified by the broad black and white band on its chest.

Grey Hornbill

What does it look like?

A hornbill is unmistakeable due to the prominent casque on its beak. A grey hornbill can be easily distinguished by the fact that it has grey feathers all over its body.

What does it eat?

A grey hornbill eats various kinds of fruits.

Where can I spot it?

A hornbill can be seen in open forests and cultivation. You'll generally find it perched high up on a fruiting tree.

How does it breed?

A grey hornbill generally nests in a hollow of a tall tree and breeds between March and June. It exhibits very interesting nesting behaviour. The female enters the hollow and seals herself inside the hole, using her droppings. The only opening to the hole is in the form of a small vertical slit, which the male uses to feed the female.

Did you know?

Hornbills are known to touch bills gently or lock them with each other's, sometimes even during flight. Nobody really knows why they do this. It could be to show aggression, or to play and bond. What do you think?

Red Headed Vulture

What does it look like?

Vultures are large birds with short tails and broad wings. Most have long necks and bald heads. There are different kinds of vultures seen in our country, the red-headed being one of them. It has a prominent bald red head and a black and grey body.

What does it eat?

Like other vultures, a red-headed vulture is a scavenger. This means that it eats the flesh of dead animals. It uses its eyesight or its sense of smell to locate rotting carcasses. It is quite timid and approaches a carcass when other animals have had their fill. If other animals are still feasting on the carcass, it quickly sneaks up, grabs some flesh and withdraws.

Where can I spot it?

You can find it near rotting carcasses. It can be seen in open forests, cultivations and semi desert areas.

How does it breed?

It makes a large nest of twigs on top of a tree.

Did you know?

A red headed vulture has a wingspan of nearly eight and a half feet!

Yellow-Footed Green Pigeon

What does it look like?

This bird looks quite a bit like our familiar, everyday pigeon in terms of shape and size, but it is very differently coloured. It is greenish yellow and ashy grey in colour and true to its name, has yellow legs.

What does it eat?

It eats berries and fruits.

Where can I spot it?

It can be found high up in a tree, rarely descending to the ground. It can be seen on a roadside tree in a town or a village, apart from well-wooded country. These birds are found in large numbers in peepul and banyan trees when these are fruiting.

How does it breed?

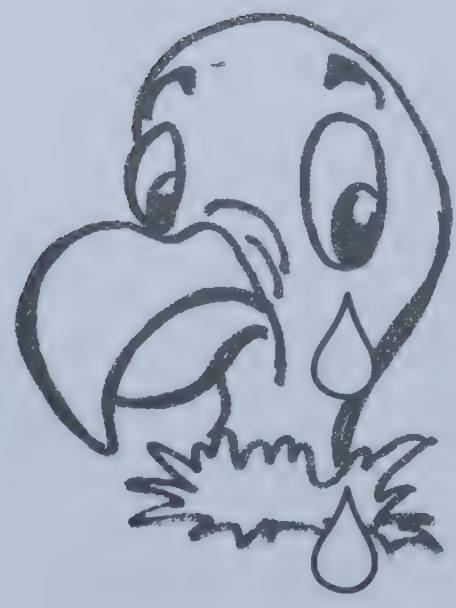
Its nest is made from twigs and is concealed high up in trees. It lays about 2 white, glossy eggs at a time. Both parents take part in all domestic duties.

Did you know?

A yellow-footed green pigeon is a skilful climber and can cling upside down to a branch in order to reach a ripe fruit.

Write a Letter

Gidhu is a little baby vulture that is feeling very sad. People consider vultures ugly and smelly birds and that makes Gidhu cry. Write a short letter to Gidhu telling her what you feel about her.

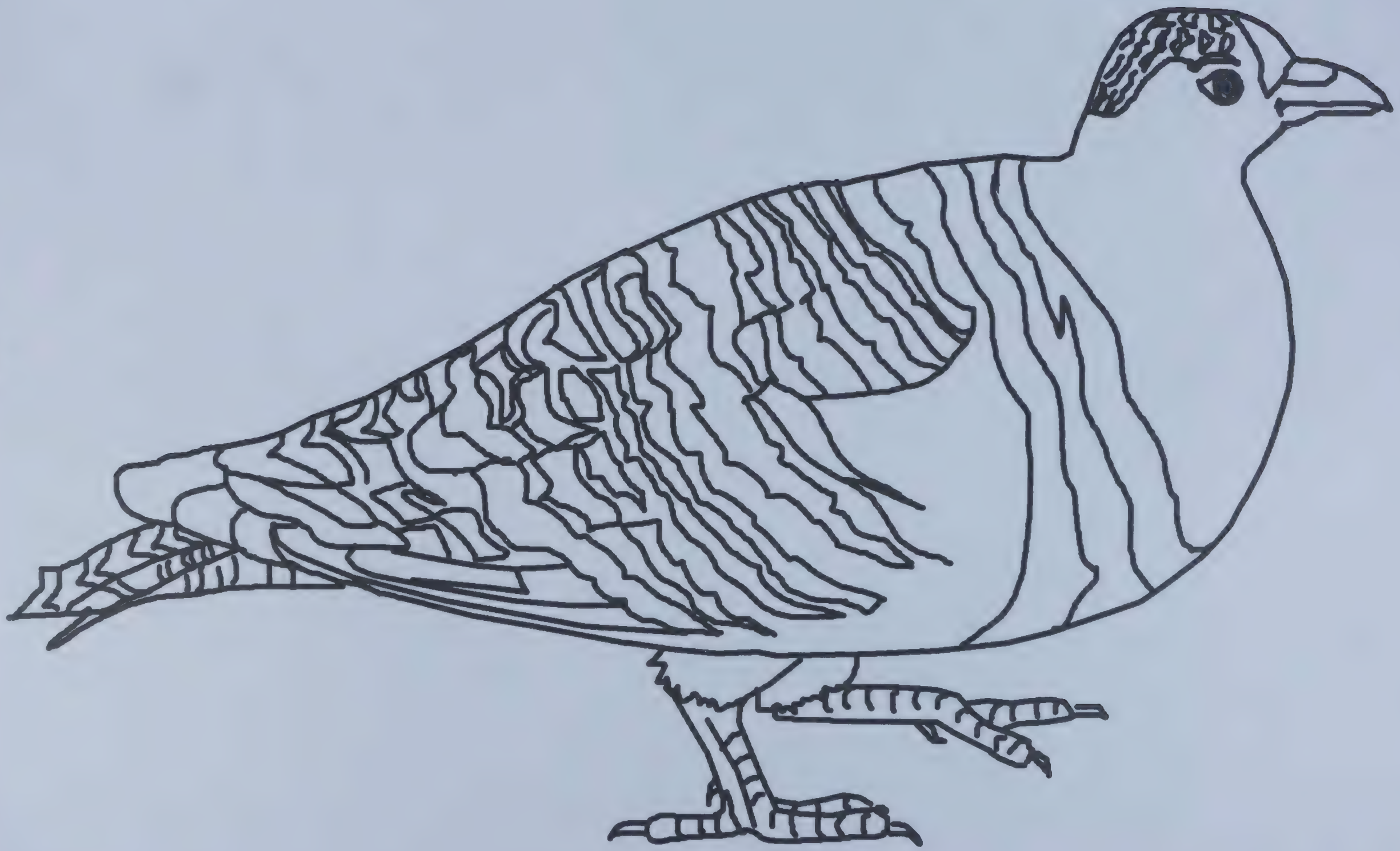


Colour Me!

Look at the outlines of these birds. Have you seen them in the forest? They have very interesting colours and markings on their bodies. Fill in the outlines with the correct colours.

Jungle Fowl

Painted Sandgrouse



F. Actions & Behaviour

Some birds can be recognised from a distance because they have a very peculiar gait or flight. There can be other behavioural clues too – for instance, if you spot a large white bird on top of a buffalo, it is most likely an egret.

Cattle Egret

What does it look like?

A cattle egret is a white bird, with a dull orange beak and legs. When standing it has a hunched posture. During the breeding season, it gets an orange-buff colour on the head, neck and breast.

What does it eat?

It eats ticks, grasshoppers, crickets, spiders, flies, moths, and even tadpoles and lizards.

Where can I spot it?

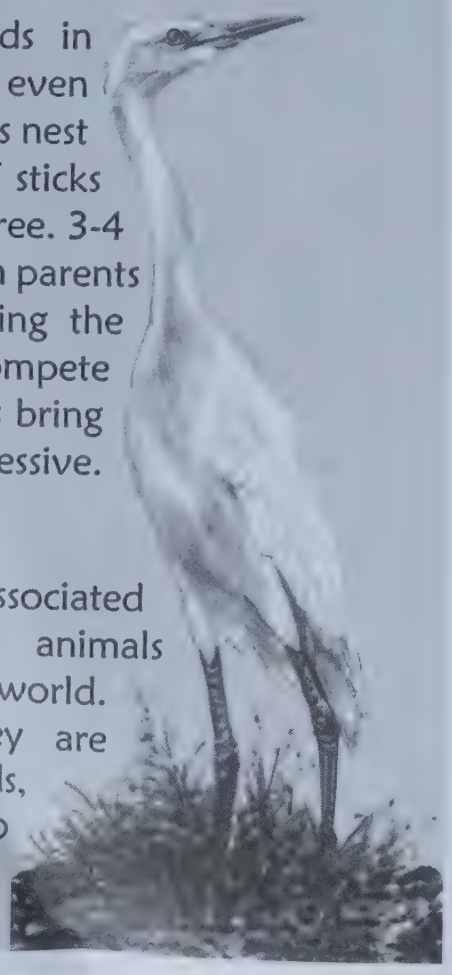
It is a commonly seen bird, found almost all over the world. It perches on the backs of livestock or wild animals from where it picks out ticks or flies. It also catches insects which may be disturbed by the animals as they graze. To spot a cattle egret, head to agricultural areas near wetlands.

How does it breed?

A cattle egret breeds in small colonies, often even in towns and cities. Its nest is an untidy bowl of sticks and twigs in a large tree. 3-4 eggs are laid and both parents are involved in raising the young. The chicks compete for food that parents bring and can be quite aggressive.

Did you know?

Cattle egrets are associated with various large animals elsewhere in the world. Based on this, they are called cow birds, elephant birds, rhino egrets and more.



Friends in the Forest

Cattle egrets and buffaloes are great friends and help each other out. As cattle walk on the ground, they often disturb small insects in the grass. Cattle egrets prey on these. Hence, by being with cattle they find their food easily. Cattle egrets also pick out small insects like ticks from the bodies of these animals. Ticks trouble cattle, so they are happy to have egrets make a meal of them. Do you know any other creatures in the forest that help each other out? Name two pairs and explain how.

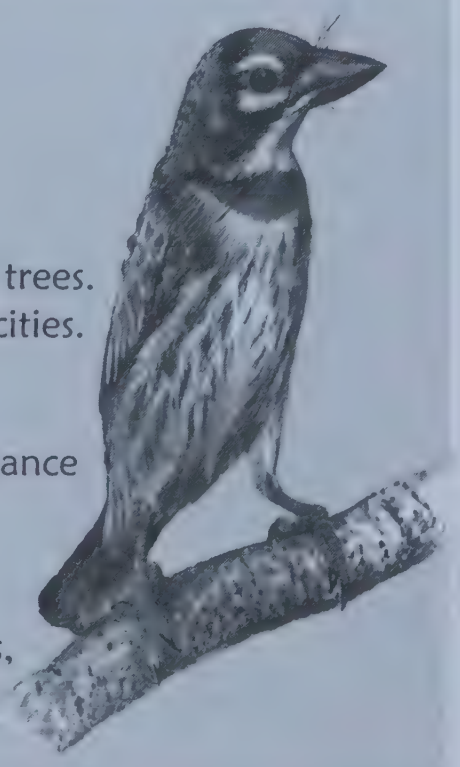
G. Calls

We have all heard birds calling. Some calls are loud shrieks, some are pleasant cooings, while some are melodious whistles. The coppersmith barbet is named so because it sounds like a coppersmith. A drongo is called a *kotwal* in Hindi since its whistle sounds just like that of a guard. With experience you can recognise many birds just by their calls.

Coppersmith Barbet

What does it look like?

A small and colourful bird, this barbet is overall green in appearance, with a red forehead, yellow eye ring and a red and yellow throat.



What does it eat?

It eats berries, fruits and occasionally, insects.

Where can I spot it?

You can generally find it on fruiting trees like peepul, banyan and other fig trees. It can be found in gardens, groves, edges of forests and even inside noisy cities.

How does it breed?

It bores a hole in a tree to make its nest. The male performs a courtship dance where it sings, bobs its head, puffs up its throat and flicks its tail.

Did you know?

A coppersmith barbet is best known for its call. It gives a continuous, monotonous *tuk-tuk-tuk* call, which gives the barbet its name in many languages.

Mimic a Bird

How would you describe the calls of the following birds? Write down their sounds here. Try to mimic each and ask your friends to guess which bird's call it is.

Coppersmith Barbet - *tuk tuk tuk tuk*

Pigeon _____

Peafowl _____

Jungle babbler _____

Crow _____

Crested hawk eagle _____

H. Habitat

You might have noticed that certain birds are found only in certain spots. For instance, ducks, geese, kingfishers, pond herons are all found near water bodies. Some species like coppersmith barbets and grey hornbills are generally seen on fruiting trees.

Where Do I Live?

Look at the birds below. Match each one with the habitat in which it is found.

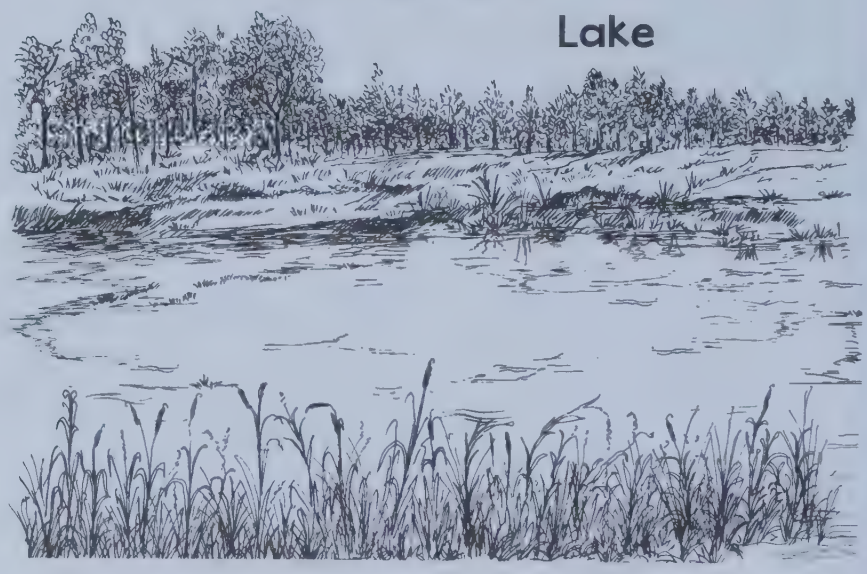
Crested Lark

Rose-Ringed Parakeet

Pond Heron

Fruit Tree

Lake



Grassland

I. Date, Time, Place

Some birds appear around you only in certain seasons. For instance, common teals can be seen in winter, but not in summer. Why do you think that happens? Where do they go?

Some animals move from one place to another every season. They do this to escape the cold or heat and to find food. When the climate is better, they move back. This regular, seasonal movement is called migration. Birds, mammals and even other creatures migrate—sometimes over thousands of kilometers! You may have noticed that some animals are seen only at certain times of the year. This is because they migrate.

Common Teal

What does it look like?

The male and female of this species look quite different. The male is a dull grey all over, with a chestnut head and a broad green stripe from its eye to its nape. The female is a mottled brown.

What does it eat?

It eats insects, worms and other creatures found in water. It also eats aquatic plants and grasses.

Where can I spot it?

You can find common teals in large flocks in lakes and ponds.

How does it breed?

It nests on the ground near water. Its nest is lined with feathers and leaves.

Did you know?

Common teals fly thousands of kilometres from North Asia and Europe to come to India every winter.

Migration

From these birds, tick the one that is migratory.

Pintail

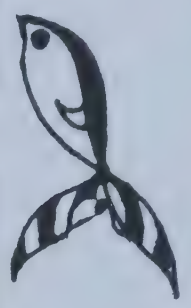
Black Drongo

Bulbul

Maze

As you well know by now, different birds eat different food. Help these birds find their food.

Pigeon



Fish

Bee-eater

Grain

Pelican

Insect

Letter Jumble

Unjumble the names of these birds:

1. LOEGND ROOIEL

2. HIAGJNTR

3. ANNIID EORRLL

4. RLETUVU

5. LTCEAT GEERT

6. GEJNUL ELBBBRA

Quiz Time!

Name 3 birds that:

have crests	1. _____	2. _____	3. _____
are mainly green	1. _____	2. _____	3. _____
nest in tree cavities	1. _____	2. _____	3. _____
eat insects	1. _____	2. _____	3. _____
eat fruit	1. _____	2. _____	3. _____

Mammals

Mammals are fascinating creatures! We human beings are mammals ourselves, as are most of the creatures we interact with – dogs, cats, cows, buffaloes, goats. So, what are mammals?

Mammals are organisms that have four limbs and fur or hair on their bodies. They range in size from small rats to huge elephants. What sets them apart from birds, reptiles, amphibians and insects is that almost all do not lay eggs. They give birth to live young ones. Not only that, they feed milk to their young.

Most mammals live on land. There are mammals such as bats which fly, and dolphins, which swim. However, these are exceptions.

Favourite Mammals

Our forests have a number of mammals, many of which are quite difficult to spot. How many have you seen? Name three of your favourites.

1. ----------

2. ----------

3. ----------

Did you know?

There are about 5,416 species of mammals in the world, of which India has about 423.

The Herbivores

There are many herbivores or plant-eaters in our forests. Among them, are deer and antelopes. Deer and antelopes belong to a very elegant looking family of animals. They have long and slender legs, and the males have horns or antlers on their heads. A deer has antlers which it sheds every year to grow new ones. Deer commonly seen here are chital, sambar and barking deer. Antelopes on the other hand, have horns, which they do not shed. nilgai, chinkara and chowsingha are among the antelopes found in our forests.

Chinkara

What does it look like?

A chinkara is about 3 feet tall at the shoulder and its horns can grow to more than a foot in length. It has a sandy brown coloured coat. Females are shorter than males and have shorter horns as well. chinkaras have very distinct faces, with white and reddish brown stripes.

What does it eat?

It eats different kinds of grasses, various leaves, crops and fruits. Its water intake comes mainly from this vegetation and it can go for long periods without drinking. A chinkara is most active just prior to sunset and through the night.

Where can I spot it?

A chinkara is a shy animal. It is very swift and retreats quickly when it sees humans. It likes to be alone or in small groups. It dwells in a variety of habitats, including dry forests, open woodlands and deserts.

How does it breed?

A chinkara male is territorial and defends its territory by fighting with other males using its horns. Such competitions can be seen especially during the breeding season. The female generally gives birth to one offspring, but people have also reported having seen twins.

Did you know?

Do you know how the chinkara got its name? When alarmed, it stamps its front foot on the ground and makes a sneeze-like hiss through its nose. The word chinkara comes from "*chhinkara*" (the sneezer).

Nilgai

What does it look like?

The nilgai is the largest antelope in our country. It has a powerful body and stands at almost five feet tall at the shoulders. The male has bluish grey fur as an adult, earning the species its name. It is much larger than the female and can weigh up to 300 kilograms. The female is tawny brown. Only the male has horns. These are short, sharp and curve forward.

What does it eat?

A nilgai eats plant food such as grass, leaves, fruits and seeds, grass being its main diet. It also feeds on agricultural crops. It grazes during the day.

Where can I spot it?

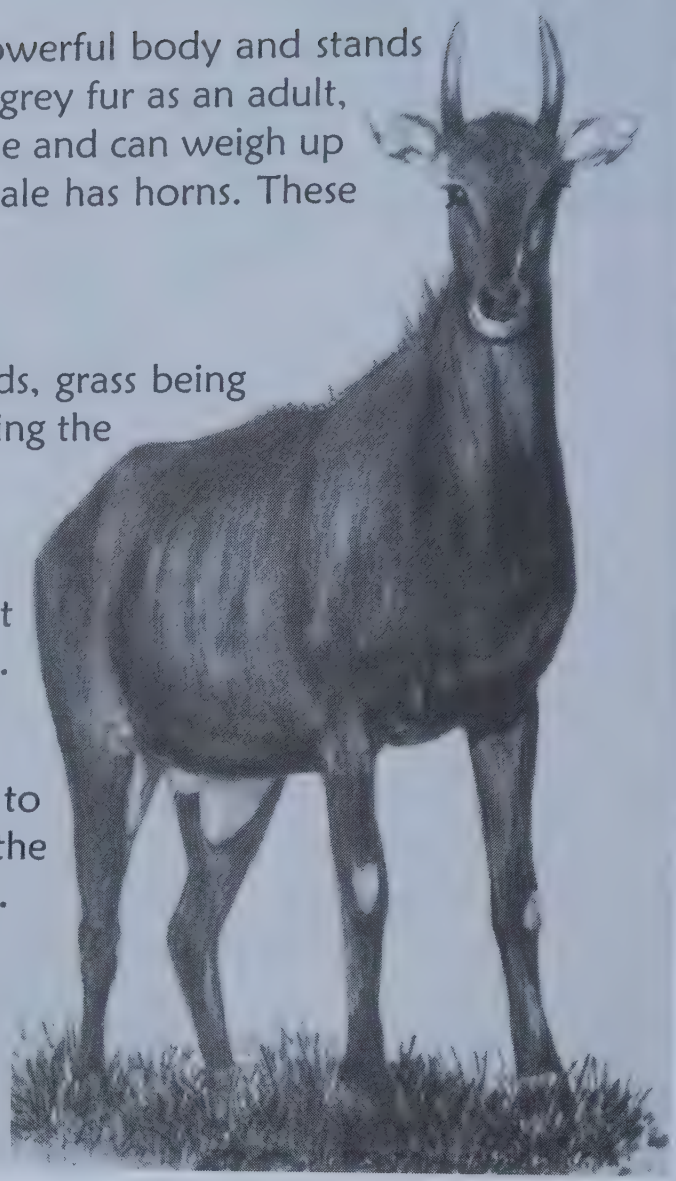
It is quite a commonly seen wild animal throughout India. It is found in scrub forests, hillsides as well as agricultural fields.

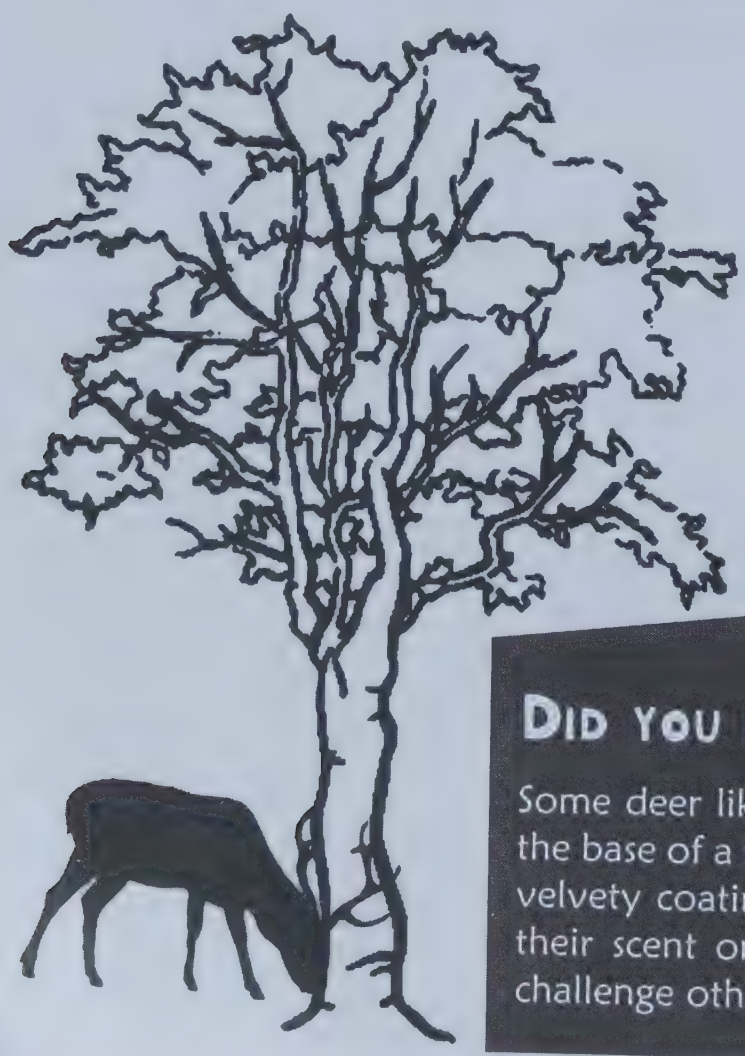
How does it breed?

It gives birth to 1 or 2 calves at a time. These calves are able to stand upright soon after birth. The mother nurses them for the first month after which they are able to forage on their own.

Did you know?

A nilgai often raids agricultural fields. However, since some communities consider it cattle, it is thought of as sacred. This helps in protecting its population to some extent.





Did you know?

Some deer like chital rub their antlers against the base of a tree. This is a way to remove the velvety coating off their antlers and to leave their scent on the tree to attract mates and challenge other males.

Mysterious Mammal

Have you seen any mammal that you weren't able to recognise? Or one that is seen very rarely? Draw or describe it here.

Sambar

What does it look like?

The sambar is the largest deer in our country. It has a uniform dark brown coat, large, spreading antlers and a bushy black tail. The female is lighter coloured than the male and is not as shaggy.

What does it eat?

It eats various plants, fruits, and grasses. It forages during early morning and late evening.

Where can I spot it?

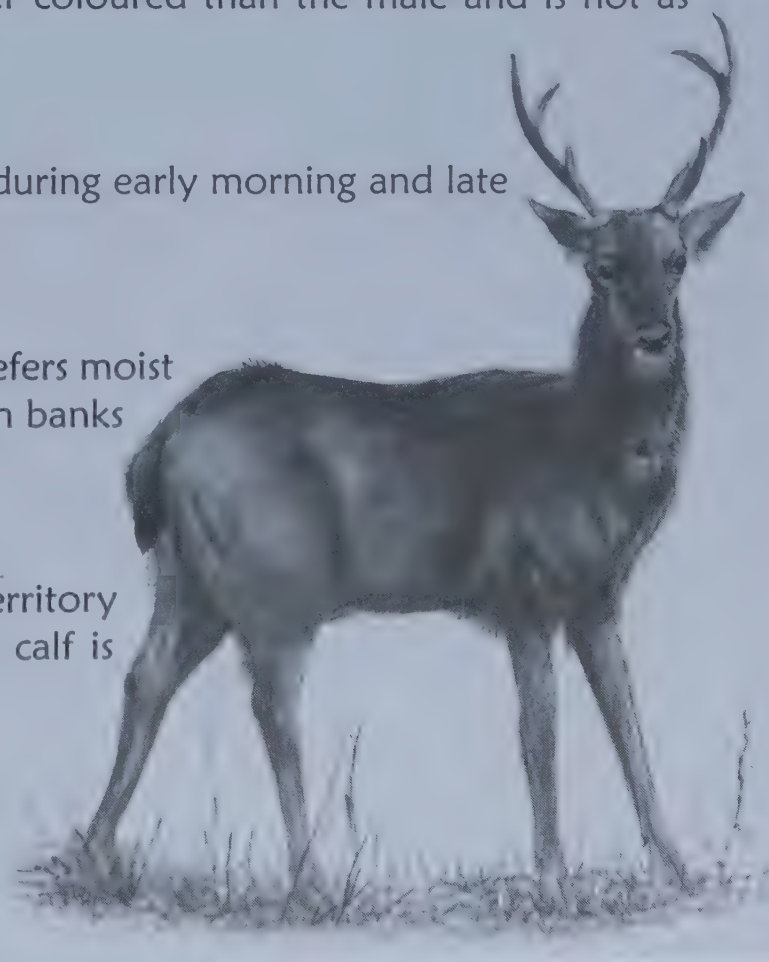
It can be found in forests as well as grasslands. It prefers moist places and can be seen resting near river and stream banks during the day.

How does it breed?

It breeds all year round. The male will mark his territory and attract the female for mating. Generally, one calf is born at a time.

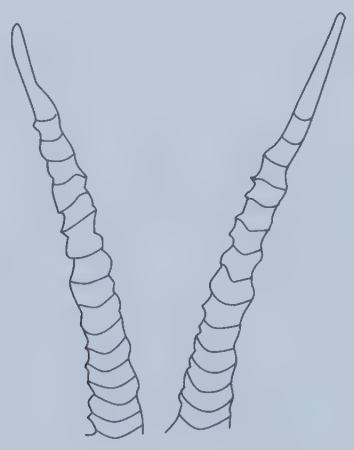
Did you know?

When a sambar is chased by a predator such as a wild dog, it gets into shallow water and splashes about quite noisily, to confuse the attacker.



Antlers and Horns

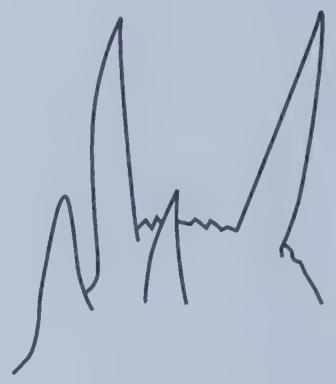
Have you noticed the horns and antlers of deer and antelope? Each species has a unique shape. Can you recognise who these belong to? Write the correct name from those given here below each pair of horns or antlers.
(barking deer, chital, sambar, nilgai, chinkara, chowsingha)



(a) _____

(b) _____

(d) _____



(c) _____

(e) _____

(f) _____

The Omnivores

Omnivores are animals that consume both plant food and meat. One such animal is the porcupine.

Porcupine

What does it look like?

The porcupine is a queer looking animal. The hair on its body is modified to form multiple layers of long, sharp, needle-like spines. Hidden among the tail spines, are longer, hollow, rattling quills. The feet and hands of the porcupine are broad, with long claws that are used for burrowing. It can grow to about 2 to 3 feet in length and weigh 11 to 18 kg.

What does it eat?

It eats vegetable material of all kinds, including fruits, grains and roots from the wild as well as from cultivated crops. It also chews on bones, as it needs minerals like calcium to help its spines grow.

Where can I spot it?

It is found on rocky hill sides, open countryside, grasslands, and forests. It constructs its own burrow which has a long entrance tunnel, a large inner chamber and multiple exits. It is active at night.

How does it breed?

The porcupine gives birth to 2 to 4 offspring per year. Young porcupines are covered with short, soft quills. Both parents look after the young in their burrow.

Did you know?

A porcupine uses its quills to protect itself. If another animal comes too close, it raises its quills and rattles its tail hoping to scare it away! If that doesn't do the trick, it rushes backwards and slams itself into the other animal, piercing it with quills.

Group Game - Animal Pictionary

Form two teams. One player from one team starts the game. The opposite team gives him the name of an animal. The player draws this animal on the board and his team has to guess what it is in less than a minute. He has to communicate only through drawing. Speaking or acting are not allowed!

The Carnivores

Carnivores are meat-eaters. A variety of small and big carnivores can be found in the forests of Central India. These include stealthy cats like leopards, skilful hunters like mongooses, wild dogs, jackals and scavengers such as hyenas.

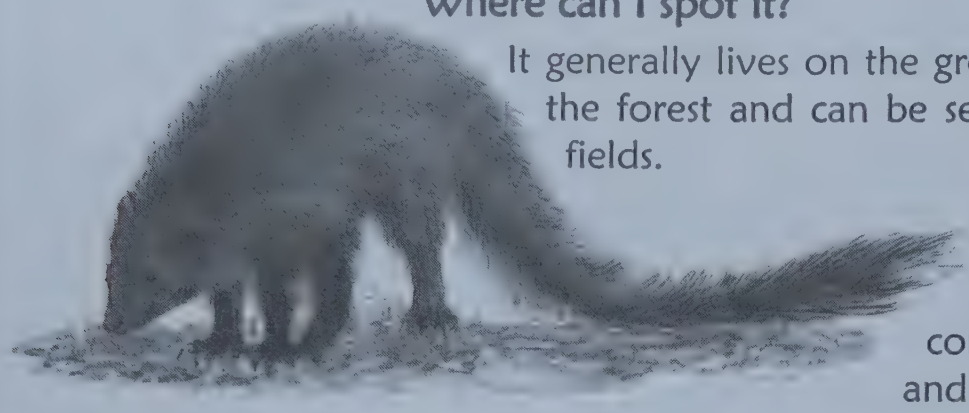
Ruddy Mongoose

What does it look like?

The ruddy mongoose is a short-legged and long-bodied mammal. Its body grows to about 35 to 45 cm in length. The tail is roughly as long as the body. It has reddish coloured fur on its body.

What does it eat?

It mostly eats mice, rats, lizards and snakes. It eats small birds if it can catch hold of them. It even eats insects at times.



Where can I spot it?

It generally lives on the ground but can also climb trees. It prefers the forest and can be seen in bushes, as well as secluded open fields.

Did you know?

In ancient India, a mongoose was considered a natural enemy of the snake and hence people kept it as a pet.

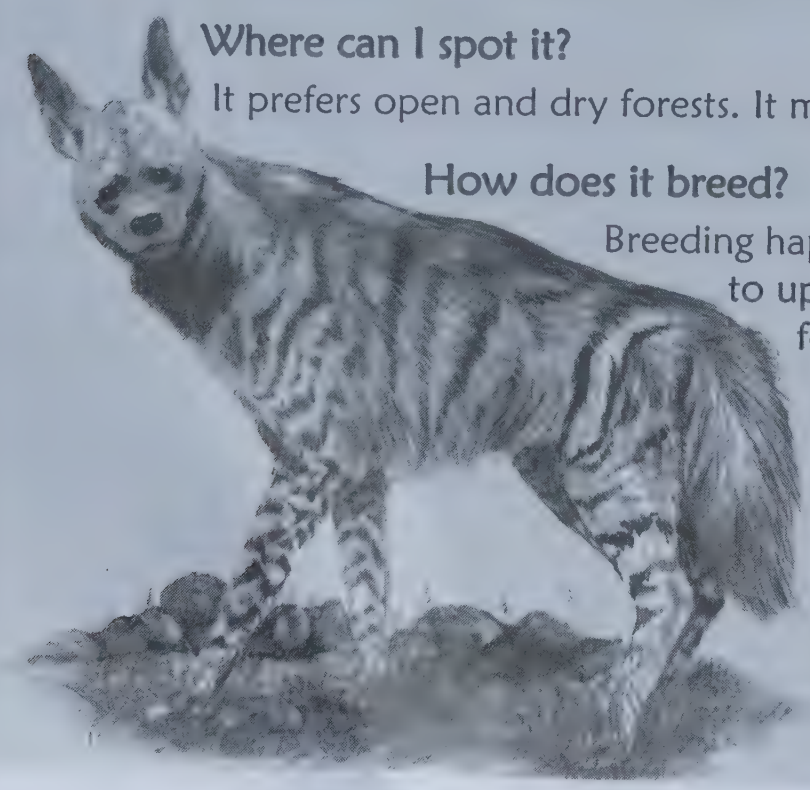
Hyena

What does it look like?

The hyena is about two to three feet tall at the shoulder. It has a massive upper-body. The hind limbs are much shorter than the forelimbs, causing the back to slope downwards. It has small eyes and large, pointed ears. It has long, coarse hair all over its body.

What does it eat?

It is mainly a scavenger that feeds on animal remains. It eats the remains of deer and other mammals. It occasionally hunts and eats hare, rodents and reptiles. It forages at night.



Where can I spot it?

It prefers open and dry forests. It makes its dens in rocky hills and crevices.

How does it breed?

Breeding happens at anytime of the year. A female gives birth to up to six cubs at a time. The mother starts to bring food to the den for her cubs after they are a month old, but continues to also feed them milk till they are about a year old.

Did you know?

When threatened, a hyena makes the hair on its mane stand up in order to appear bigger and intimidate the attacker. It is said that hyenas have a habit of feigning death when threatened.

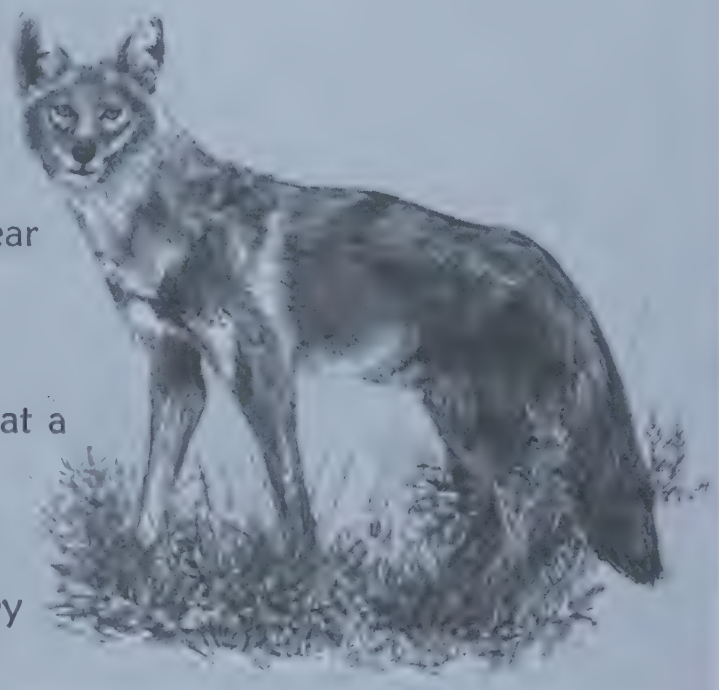
Jackal

What does it look like?

A jackal is a dog-like mammal with a greyish coat, interspersed with black hair. The fur is coarse and not very long. It's muzzle is somewhat thinner and shorter. It is bigger than a fox but smaller than a wolf.

What does it eat?

It has a varied diet. It hunts deer, rodents, hares, ground birds, reptiles and frogs. It also occasionally consumes plant food.



Where can I spot it?

It can be seen in dry open country, grasslands and even near human settlements in semi-urban areas.

How does it breed?

A jackal usually gives birth to around two to four pups at a time. Both parents provide food and protection.

Did you know?

Parents carry food for the young in their stomach. They later regurgitate it to feed the pups.

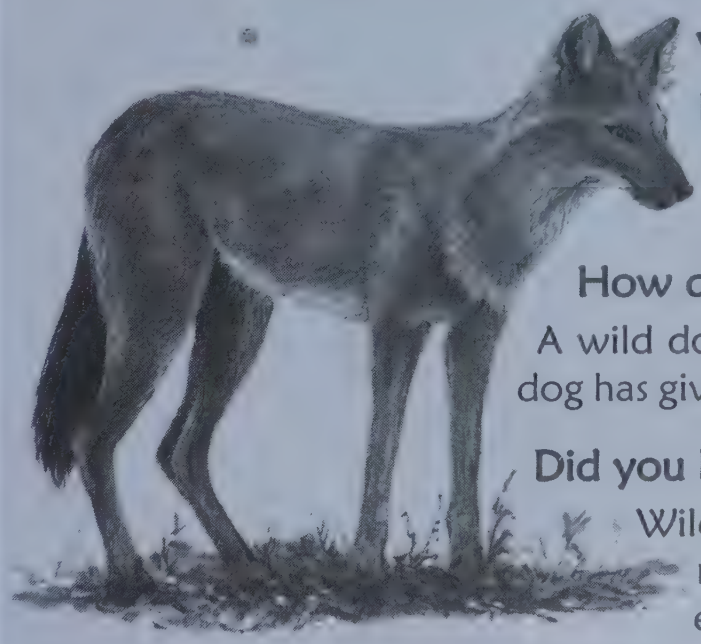
Wild Dog

What does it look like?

The wild dog, also called *dhole*, is an average sized dog, being about 20 inches high at the shoulder. It is nonetheless, quite a hunter! It has an unusually thick muzzle and a very bushy tail. Its coat is a rusty red, and can vary from light greyish brown to yellowish brown.

What does it eat?

The wild dog hunts in packs. It eats mammals ranging from rodents to deer, including wild pigs, hares, goats, sheep, and occasionally, monkeys.



Where can I spot it?

It likes open spaces and can often be found on jungle roads, river beds, grassy meadows and forest clearings where it rests during the day.

How does it breed?

A wild dog gives birth to around eight pups at a time. After a wild dog has given birth, a few other adults take part in feeding the mother.

Did you know?

Wild dogs don't normally fight or show aggression to other members of their pack. Instead, they compete for food by eating extremely fast!

Leopard

What does it look like?

A leopard is unmistakeable due to the black rosettes – flower-like designs, on its clear, golden yellow coat. It has strong and powerful jaws and a long tail. The leopard is a slender and agile cat.

What does it eat?

It has a very broad diet. It hunts small prey such as rodents, reptiles and amphibians and large prey such as deer, antelopes and domestic livestock. It stalks its prey cautiously and silently, by crouching low and pouncing on it the last minute. It hunts between sunset and sunrise.

Where can I spot it?

It occupies various types of habitats. It is indeed difficult to sight this animal as it prefers to remain hidden most of the time. It can sometimes be seen resting on top of dense trees. It also lives in caves and rocky crevices.

How does it breed?

The female attracts the male by walking up and down in front of him and swatting him with her tail! Two to three cubs are born at a time. They are initially fed by the mother but become independent when they are just under twenty months old.

Did you know?

A leopard can jump up to 6 m horizontally and 3 m vertically.

Letter Jumble

Unjumble the names of these mammals:

1. AARNHCIK

2. APELDOR

3. SGOOOMNE

4. IEROPUCPN

5. RAABSM

Perhaps the most famous of all mammals of India is the royal Bengal tiger. Because of its charisma, appeal and ecological importance, it is a subject of great fascination for thousands of people. Majestic in appearance, it is highly endangered.

Royal Bengal Tiger

What does it look like?

A royal Bengal tiger has a tawny orange coat with broad black stripes. It is white on the underside and has a white patch behind its ears. The male can grow up to 10 feet long and can weigh between 180-230 kg, whereas the female can grow up to 8 feet long and can weigh between 100-160 kg.

What does it eat?

It prefers to hunt large deer such as sambar, but can survive on smaller prey such as chital or wild boar as well. It stealthily stalks its prey, crouching in the cover of high grass or undergrowth, and takes down the prey in one sudden movement. This is followed by quickly grabbing the hapless animal at the neck with its strong jaws.

Where can I spot it?

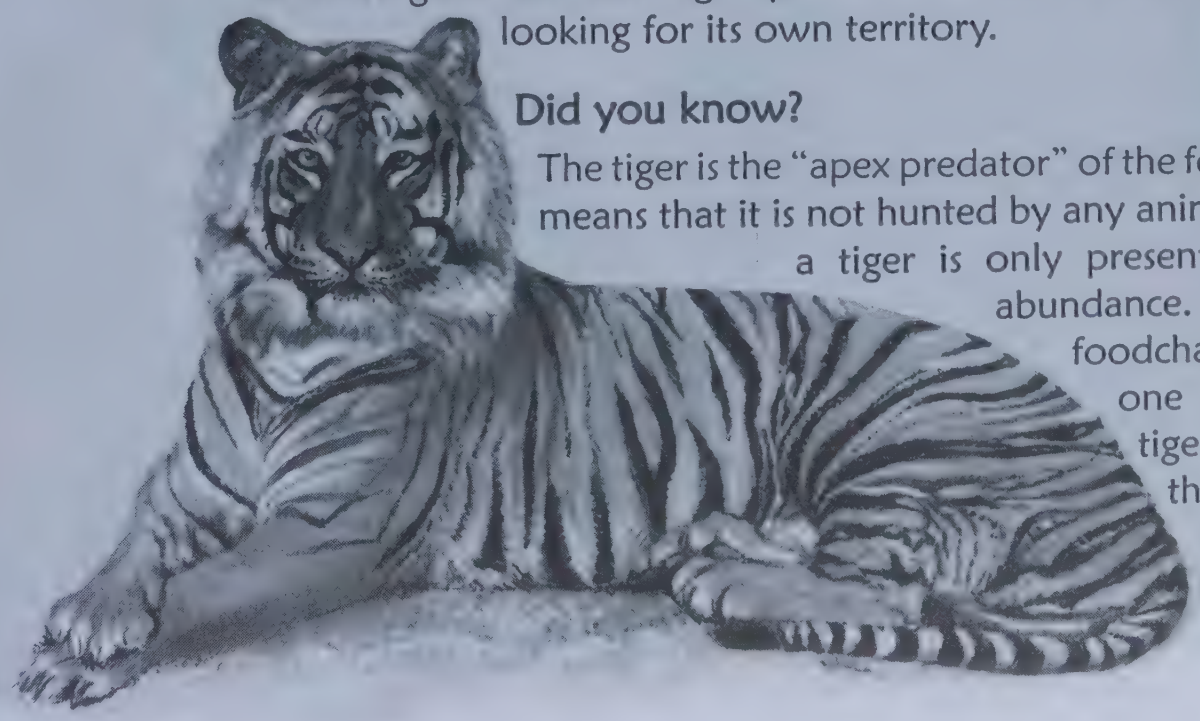
A tiger is a solitary animal. It lives and hunts alone. It is best spotted during early mornings and late evenings, when it is active. On hotter summer days, you might be able to spot one cooling off at a water body.

The location of a tiger might also be given away by other animals of the forest giving 'alarm calls'. Creatures such as chital and sambar make very specific sounds to communicate to their kin that they have spotted or sensed a tiger.

How does it breed?

Both male and female tigers mark their own areas and do not let other tigers enter them. A male maintains a large territory, which includes the home ranges of several females.

The female gives birth to 1 to 4 cubs at a time. Cubs are born in sheltered areas such as caves or tall grass. The mother gives them milk till they are about 2 months of age, after which they start following her on hunting trips. When a cub is two or three years old, it starts looking for its own territory.



Did you know?

The tiger is the "apex predator" of the forest in which it resides. This means that it is not hunted by any animal in the forest. Moreover, a tiger is only present where prey is found in abundance. Since all creatures form foodchains and are dependent on one another, the presence of a tiger in a forest indicates that there are many creatures thriving in that area and the forest is quite healthy!

Footprints

A tiger's footprints are called "pugmarks". Look at the footprints here. Can you tell which ones belong to the tiger? What about the others? Who do they belong to? Write the correct name from those given here below each footprint.

(tiger, sambar, hyena, mongoose, wild boar)

(a)

(b)

(c)

(d)

(e)

Stripes

Just as every human being has fingerprints that are different from everyone else's, every tiger has a stripe pattern that is unique. Researchers use this fact to identify individual tigers. A researcher received the following four pictures of tigers. Can you look at the stripes and decide which two pictures are of the same tiger?

(a)

(b)

(c)

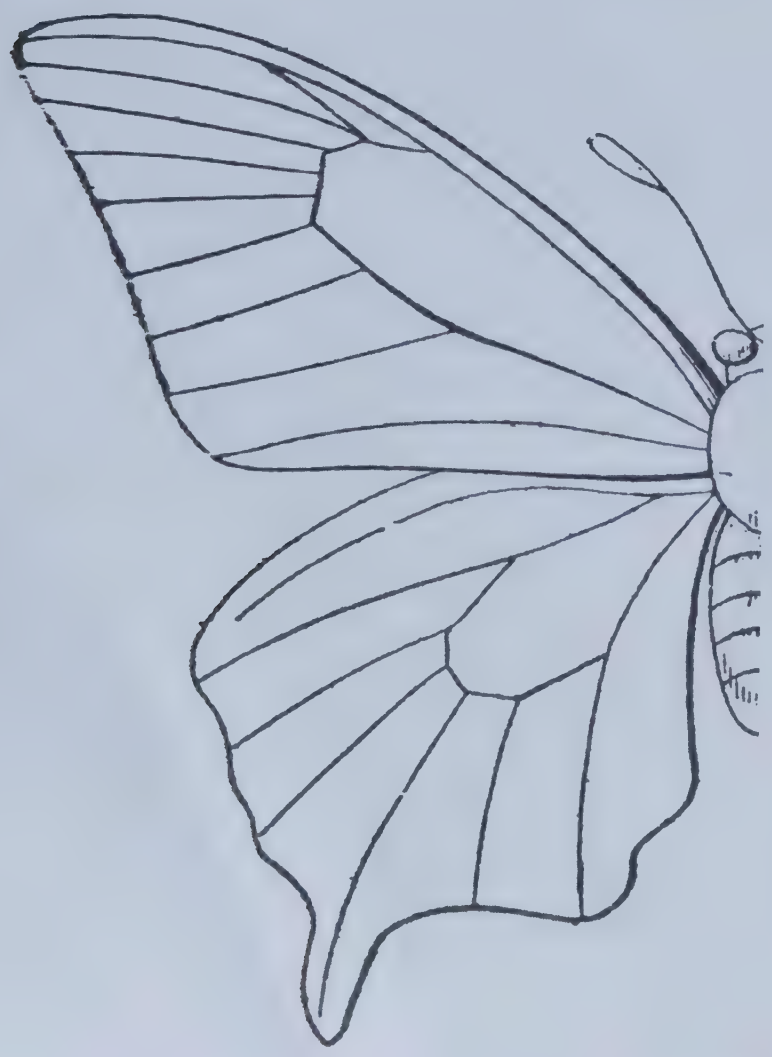
(d)

Butterflies

Butterflies are small, colourful insects. Like most other insects, they have six legs and two antennae. They have two pairs of wings. The beautiful colours that we find on butterflies are due to thousands of tiny, delicate, powdery scales.

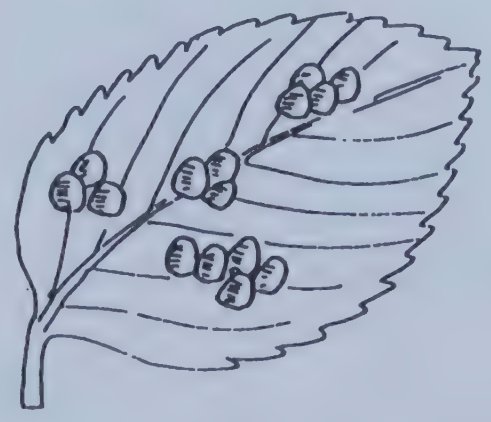
Mirror Effect

Have you noticed that butterflies have wings that are mirror images of each other? Complete the picture below and colour it as you like.

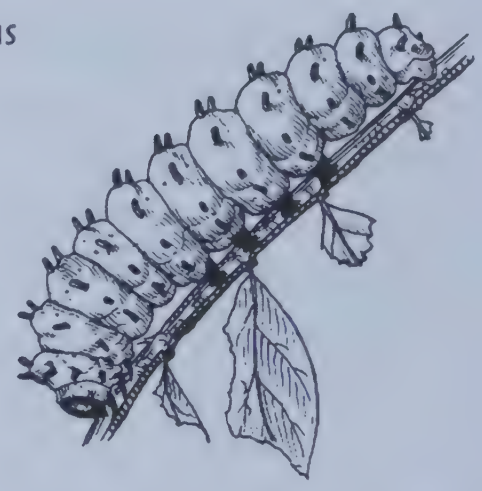


Life Cycle of a Butterfly

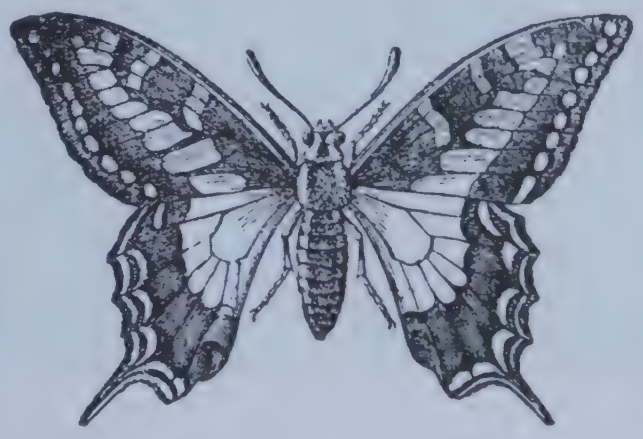
How did you look when you were born? You were much tinier than now, but you still looked like a human, right? That is not the case with butterflies. When one is born, it doesn't look like a butterfly at all, but a completely different creature! In fact it undergoes four different stages of development during its life.



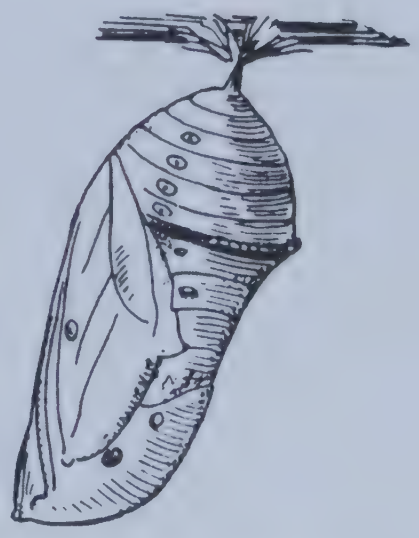
1. A butterfly starts out as an egg. Eggs are laid on leaves. They are tiny and in various shapes.



2. After a few days, a small, worm-like creature crawls out. This is called a caterpillar. As soon as it emerges, it devours its first food – the empty eggshell. Thereafter, it starts eating the leaf on which it was born. As its jaws get stronger, it becomes an eating machine, and eats the leaves, flowers and shoots of its host plant. It eats so much that its body grows quite rapidly. Its skin does not grow along with it, but stretches to its maximum capacity. The caterpillar sheds this skin, grows a new one and continues eating. It does this about 3 to 4 times.



3. When the caterpillar has grown fully, it stops feeding and attaches itself to a stick or a stone. It remains immobile for many hours and then begins to wriggle. In this movement, all the body parts that are of no use as an adult are discarded. The body changes its shape and colour, and a case is formed around it. This stage it is known as the pupa. From the outside, the pupa looks inactive, but there are a lot of changes going on within.



4. Once the conditions become favourable, the case is discarded and the adult butterfly emerges, opening its wings for the first time. It rests for a bit, flaps its wings a few times and takes off.

Observe and Create

Observe three different butterflies closely. Notice the shape of their upper wings and lower wings. Notice their colours and distinct patterns and markings. Draw these butterflies on a piece of paper and colour them. Cut out their outlines. Attach a twig or stick to each at the centre and pin or tape the butterflies to your classroom wall.

Colour and Identify

It is possible to identify species of butterflies by their patterns and colours. Colour the segments as mentioned and see if you can identify this species from the colours of its underside.

1 - black 2 - yellow 3 - orange

What do butterflies eat?

An adult butterfly consumes only liquids, mainly nectar and juices from fruits. It can also consume nutrients from animal dung and urine, human sweat and liquid mud. You may have seen groups of butterflies on damp soil or mud banks.

A butterfly uses a straw-like tube to suck liquids. This remains neatly coiled like a spring under its head, when not in use.

Did you know?

Most adult butterflies have certain preferences when it comes to choosing nectar plants, but they're not too fussy about this. Caterpillars, however, eat only the specific species of plant on which they were born. For instance, the common jezebel caterpillars feed on *banda*, whereas those of grey pansy feed on *neel jhinti*.

How do butterflies protect themselves?

Many species of butterflies are able to digest plant poisons from their food in the caterpillar stage. They store these poisons in their bodies and carry them through the remaining stages of their lives. When inexperienced predators, such as young birds attack these butterflies, they get very unpleasant reactions which quickly teach them to stay away! The bright colours and patterns are actually a way for these predators to remember the distasteful species and be warned to stay away.

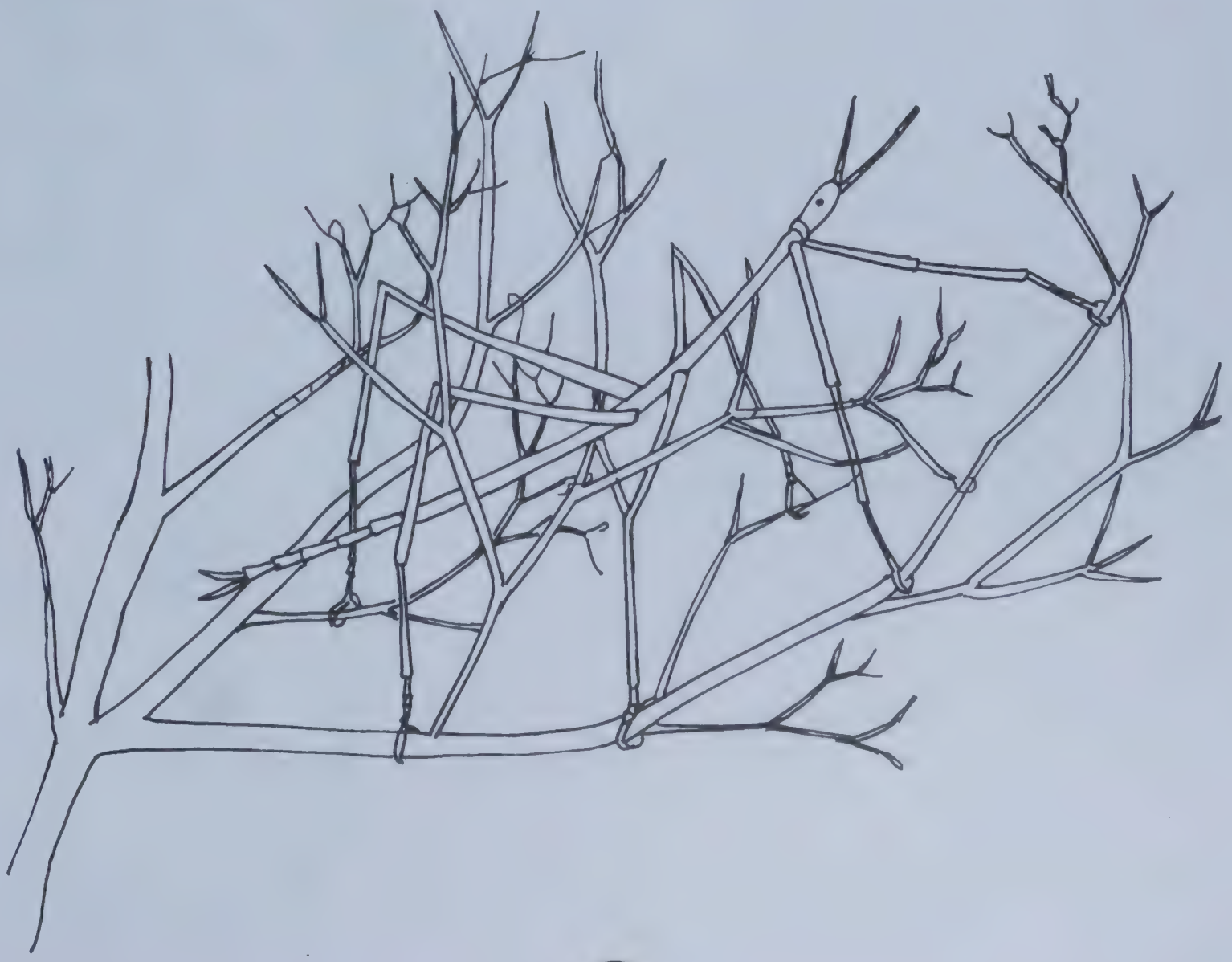
Then there are some species which are not distasteful, but look very similar to the distasteful ones. The predators get fooled and keep away from them too! This is called mimicry.

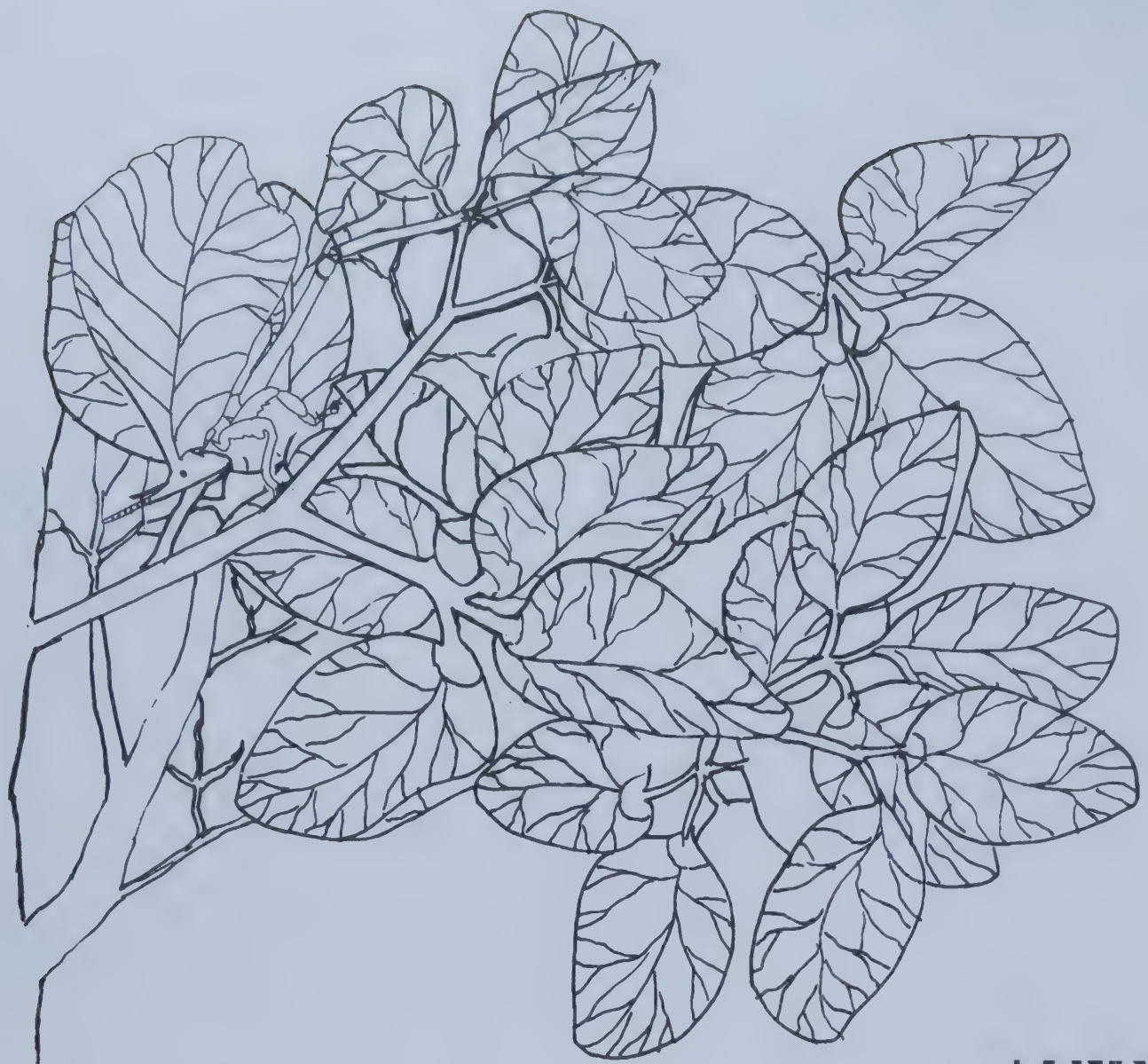
In another form of mimicry, butterflies defend themselves by exhibiting body parts which look like other creatures. For instance, some butterflies have markings on their wings which look like big eyes, and when threatened, the butterfly suddenly displays them clearly. The predator is startled for a few moments, and the butterfly takes off!

While many butterflies display vibrant colours on the wings' upperside, the undersides are very drab and dull coloured. This is to help them merge with the background by making them resemble dead leaves, or parts of a plant. This is called camouflage and helps them go unnoticed by predators like spiders, birds, frogs and lizards.

Hiding in Plain Sight

Many insects use camouflage and appear like various things in their surroundings such as leaves, twigs, soil or rocks. Some caterpillars even look like bird droppings. There is a camouflaged insect hidden in each picture. Can you find and colour them? Do you know their names?



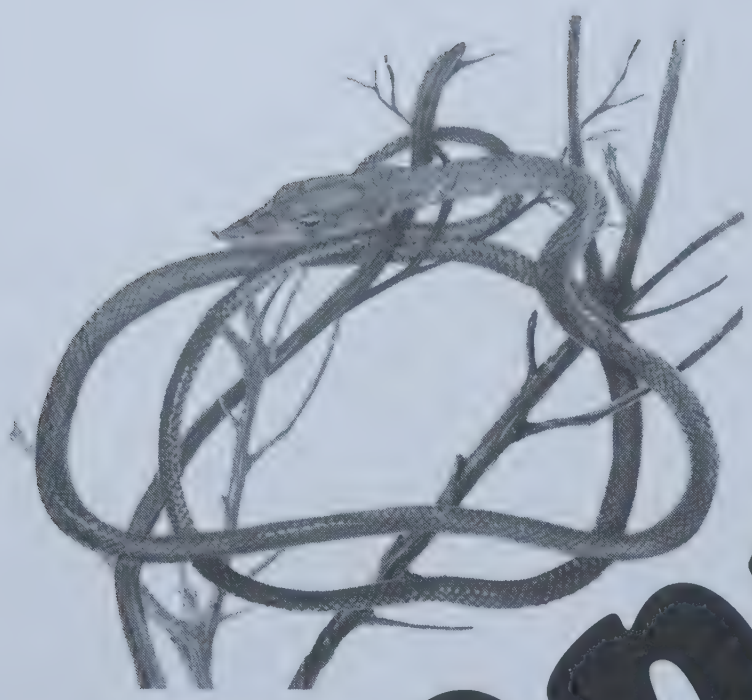


Camouflage is used not just by insects, but also birds, mammals and reptiles. Name some other creatures whose looks protect them.

Me, Butterfly!

Imagine you are a butterfly. How would you like to protect yourself from your predators? Would you camouflage yourself or would you mimic something and trick them? Draw yourself and create the wing shape, patterns and colours you would have.

The grey pansy, common jezebel and plain tiger are just a few of the butterflies found in our forests. Can you name any more?



Reptiles

What are reptiles? They are creepy-crawly creatures that can be distinguished from other animals by two important points: they are cold-blooded and they have scales.

Being cold blooded means that they depend on external factors to regulate their body temperature. When their surroundings get hot, their bodies get warmer, and when it gets cold outside, their body temperature decreases. Hence in winters, they like to bask in the sun, whereas in summers they like to cool off in the shade or near water.

Just like birds have feathers and mammals have hair, reptiles have scales on their bodies. Scales protect their bodies. In many species, the colours and patterns on the bodies merge with the surroundings, so as to avoid attention from predators, and to remain unnoticed while they hunt for their prey. Reptiles usually lay eggs.

How many reptiles can you name?

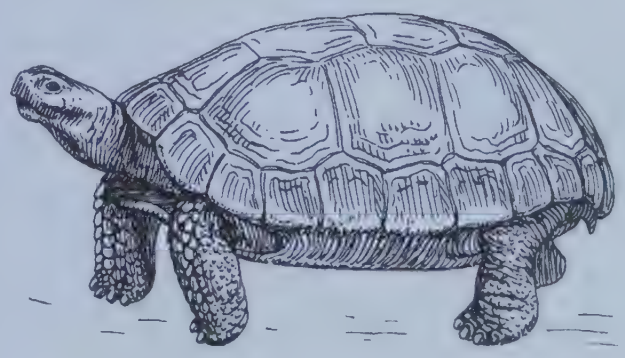
Both snakes and lizards have dry, scaly skins which do not grow with their bodies. They shed or moult them, and are protected by a fresh layer of skin that grows underneath the old one. Lizards moult their old skin in large flakes, whereas snakes moult it as one single piece.

What organ do you use to smell your food? Can you guess how some lizards and snakes smell? With their tongues! They stick out their tongues and capture scent particles in the air. These scents help them to locate food, or a mate, or to escape from their enemies!

Snakes and lizards are found in abundance all over India. Let's look at some snakes and lizards found around you.

Reptile or Not?

Look at the creatures below. Which of them do you think are reptiles? Circle them.



Snakes

Snakes are long and slender creatures. They do not have limbs and hence move very differently from other animals. They slither on various surfaces by using the muscles and scales of their bodies.

They also do not have external ears. They sense sound by feeling vibrations.

Snakes are carnivores, and eat rats, mice and other small mammals, birds, reptiles, fish, amphibians, insects and eggs.

Feel a Vibration

Put your ear to the ground and ask your friends to walk past. Did you feel it?! Now try putting two fingers on your throat and make a humming sound...see if you can feel the vibration.

Venomous and Non-venomous Snakes

Snakes are often despised or feared in many cultures because they have a deadly bite. But, did you know that most snakes in the world are non-venomous? A few snakes are venomous. They inject venom to paralyse or kill their prey through their fangs and their bite can sometimes be fatal to humans. The cobra and the common krait are such snakes.

Non-venomous snakes kill their prey by gripping it in their mouths or by coiling their bodies around it so tightly that it is unable to breathe and dies of suffocation. An Indian rock python kills in this manner.

Did you know?

Snakes do not chew their prey - they swallow it whole!

Cobra

What does it look like?

The cobra varies in colour, ranging from yellow to grey, black, brown, and tan. The main distinguishing feature of the cobra is its impressive hood, which it expands when threatened. Most cobras have a mark at the back of the hood, which looks like a pair of spectacles.

What does it eat?

It eats frogs, lizards, rats, other rodents and birds.

Where can I spot it?

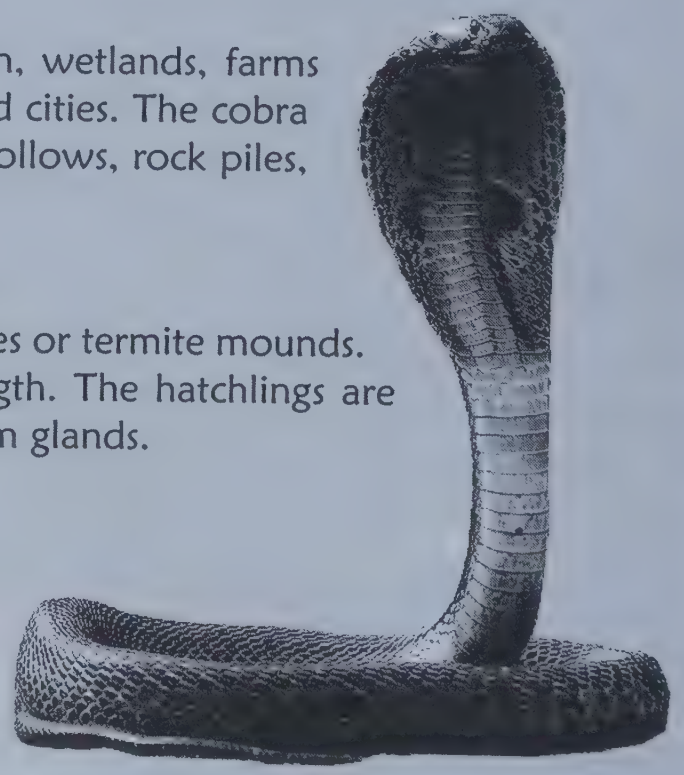
It can be found in dense or open forests, rocky terrain, wetlands, farms and even in heavily populated areas such as villages and cities. The cobra is often found in the vicinity of water. It hides in tree hollows, rock piles, termite mounds and small mammal dens.

How does it breed?

The female usually lays between 10 to 30 eggs in rat holes or termite mounds. The hatchlings measure between 20 and 30 cm in length. The hatchlings are independent from birth and have well developed venom glands.

Did you know?

Cobras, due to their striking posture were the popular choice of snake charmers. Charmers, with cobras in their baskets used to be a familiar sight across India. However, snake charming has been declared illegal by the Government of India.



Common Krait

What does it look like?

The common krait has a slender, shiny bluish-black body. The main distinguishing feature is the presence of milky white bands starting from the end of the neck and getting more prominent towards the tail. Its belly and lips are white. Its average length is 3.5 feet.

What does it eat?

It hunts other snakes and occasionally frogs, lizards and rats.

Where can I spot it?

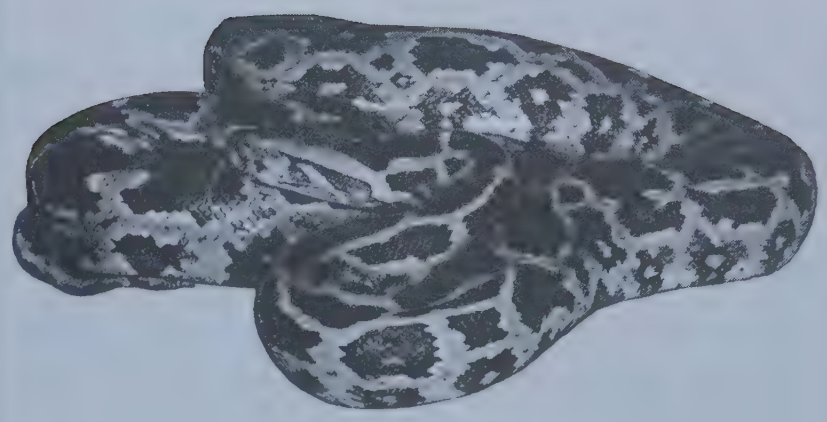
It is active at night. During the day it can be seen resting in piles of bricks or stones, or in termite mounds, burrows, on farms and near water bodies.

How does it breed?

Mating season begins in summer and the female lays 8-12 eggs in a mound, a hole, or dense and dry leaf litter, in a very secretive manner. Hatching occurs during the start of monsoon.

Did you know?

The krait is one of the Big Four venomous snakes in India which are responsible for most snake bite deaths. The other three are the cobra, the Russell's viper, and the saw-scaled viper.



Indian Rock Python

What does it look like?

The Indian rock python is a large snake which can grow to a length of about 20 feet. It has a light, buff coloured body with dark brown or tan coloured blotches on it. It has an arrow-like marking on the top of its head.

What does it eat?

A python is a non-venomous constrictor, a snake that kills its prey by squeezing. Mammals are the preferred prey, but it will also eat birds and fish. A large python can squeeze the life out of a deer, jackal, monkey or porcupine. Occasionally, even a leopard has been hunted and swallowed whole, head first!

Where can I spot it?

The python is found in a wide range of habitats, including forests, grasslands, swamps, marshes and rocky foothills. It is often found near water and is a good swimmer. Sometimes it can be found in abandoned mammal burrows, hollow trees and dense water reeds.

How does it breed?

It is a solitary creature, but the male and female seek each other out to mate. The female settles on leaf litter and coils about her eggs to incubate them. 6-7 eggs are laid at a time.

Did you know?

After a python's big meal, like a deer or a jackal, the snake may not have to eat again for as long as a year!

Where do snakes live?

Different snakes prefer different habitats. Some live in open areas, others like to stay hidden in leaf litter on the forest floor. Some prefer being in or around water bodies, whereas some like dry, rocky patches. Many spend most of their lives on trees, whereas there are some which burrow in the ground.

Vine Snake

What does it look like?

The vine snake is a thin, long, green or occasionally brown coloured snake with a distinctly pointed snout. When disturbed, it expands its body to expose black and white scale markings. It may also open its mouth in threat display and point its head in the direction of the perceived threat.

What does it eat?

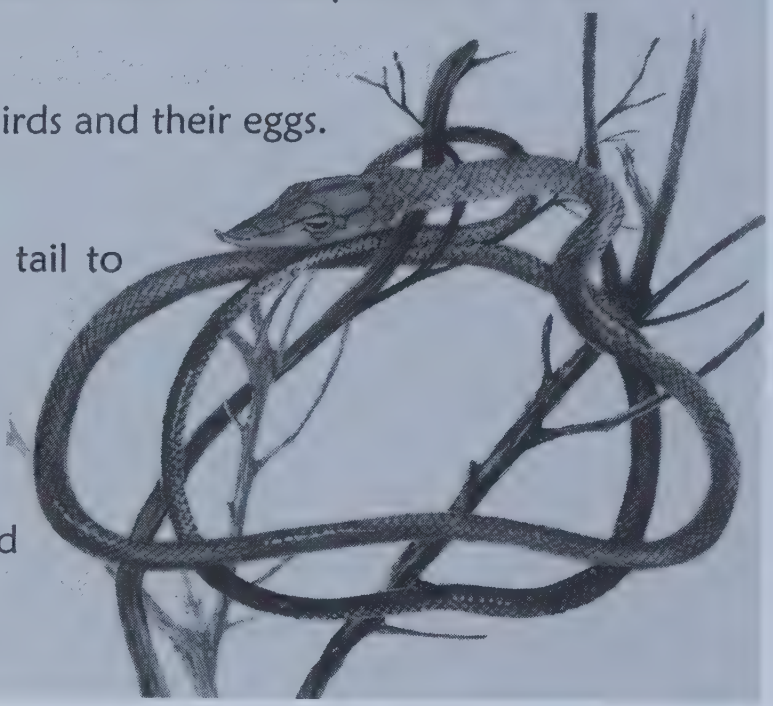
It is active during daytime and feeds on lizards, frogs, birds and their eggs.

Where can I spot it?

It is found on trees and small bushes. It uses its long tail to slither amongst the branches and leaves.

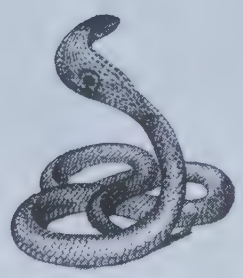
Did you know?

The green vine snake moves slowly and relies on camouflage when it hunts for prey. Its elongated, thin, green body looks like a vine, while its pointed head resembles leaves.



Where Am I?

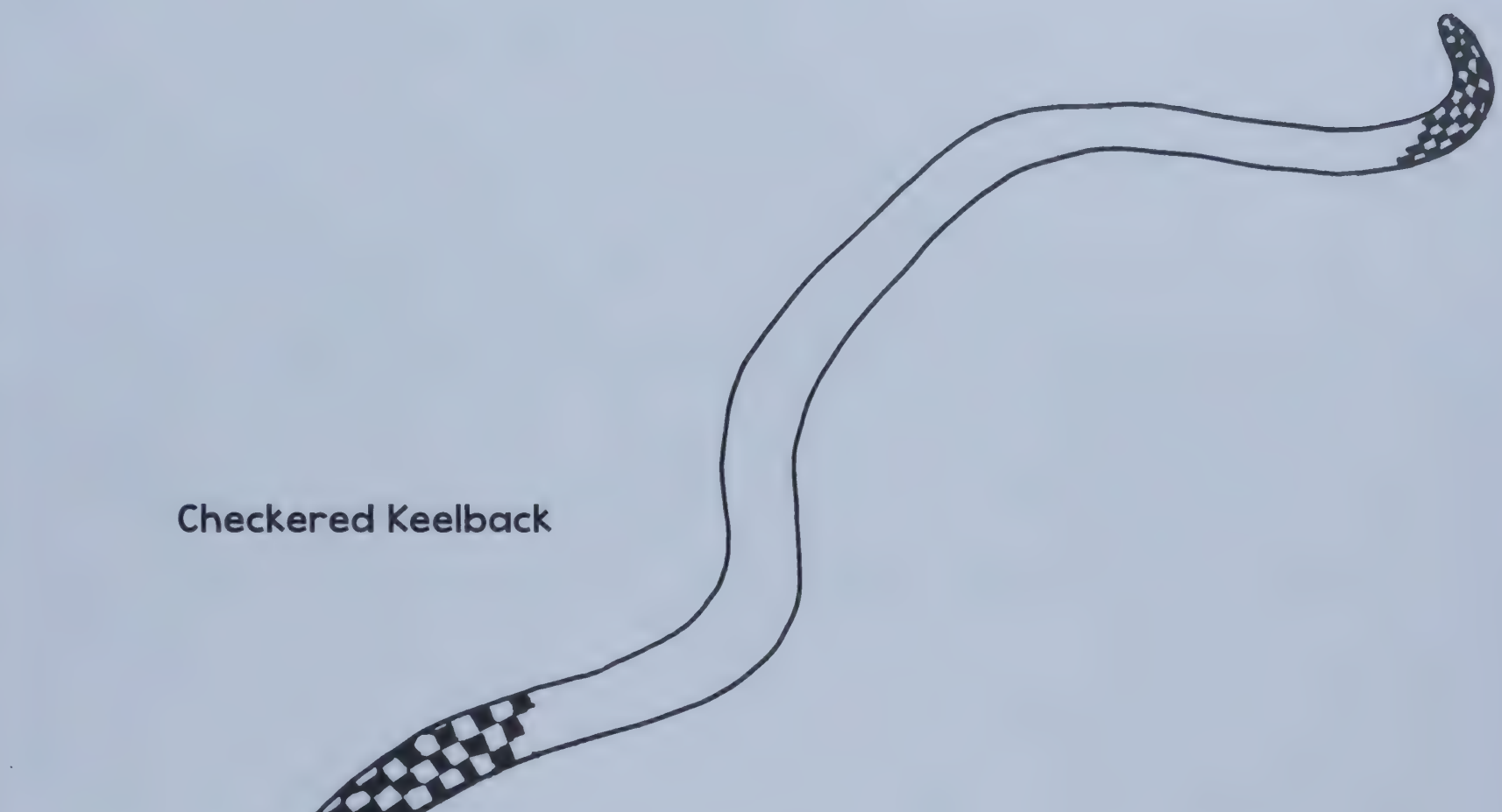
Where do you think this cobra is sitting? Draw the habitat around the snake.



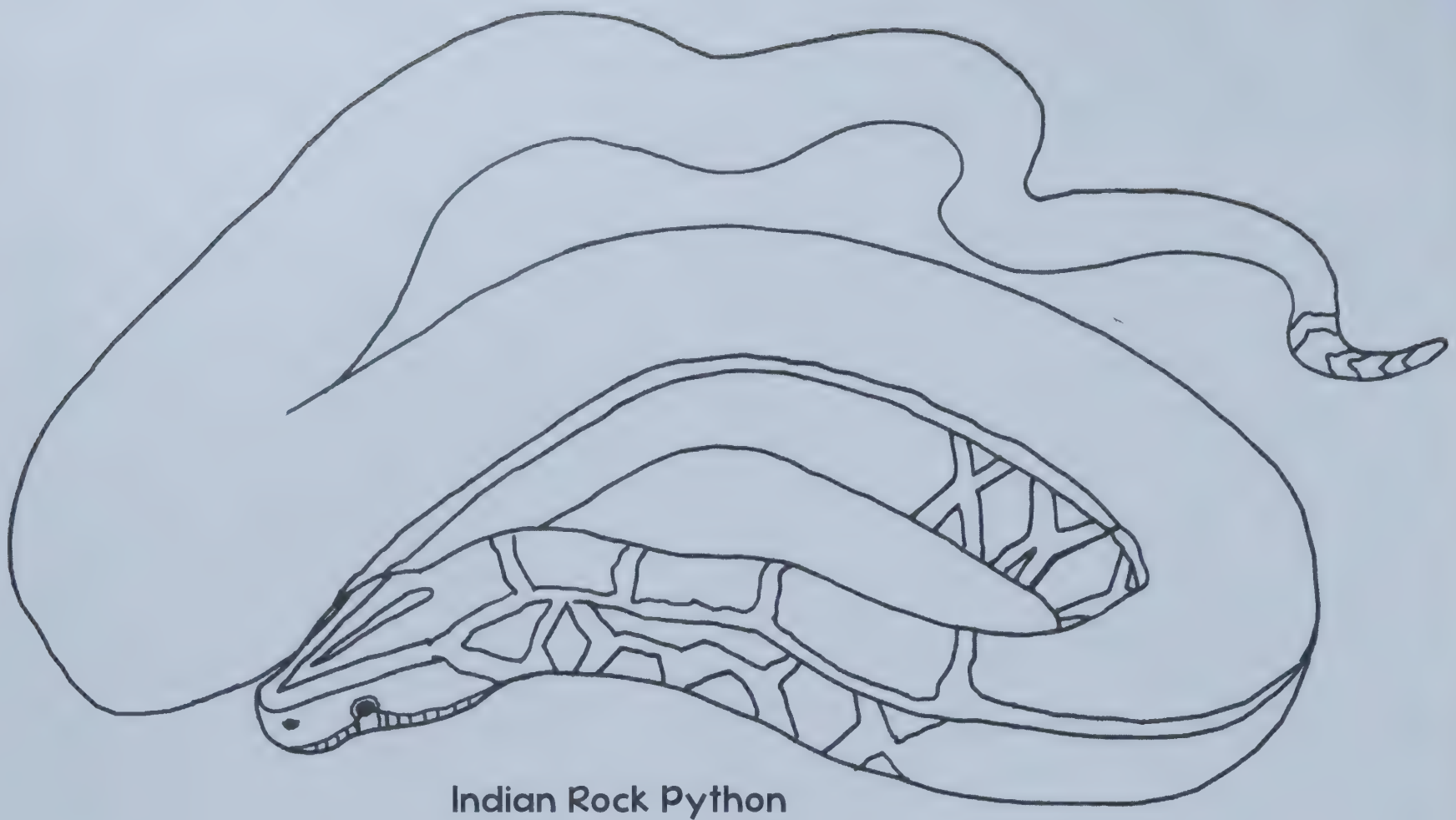
Snake Patterns

Complete the outlines below by filling in the distinctive markings found on each snake. Colour them after making the patterns.

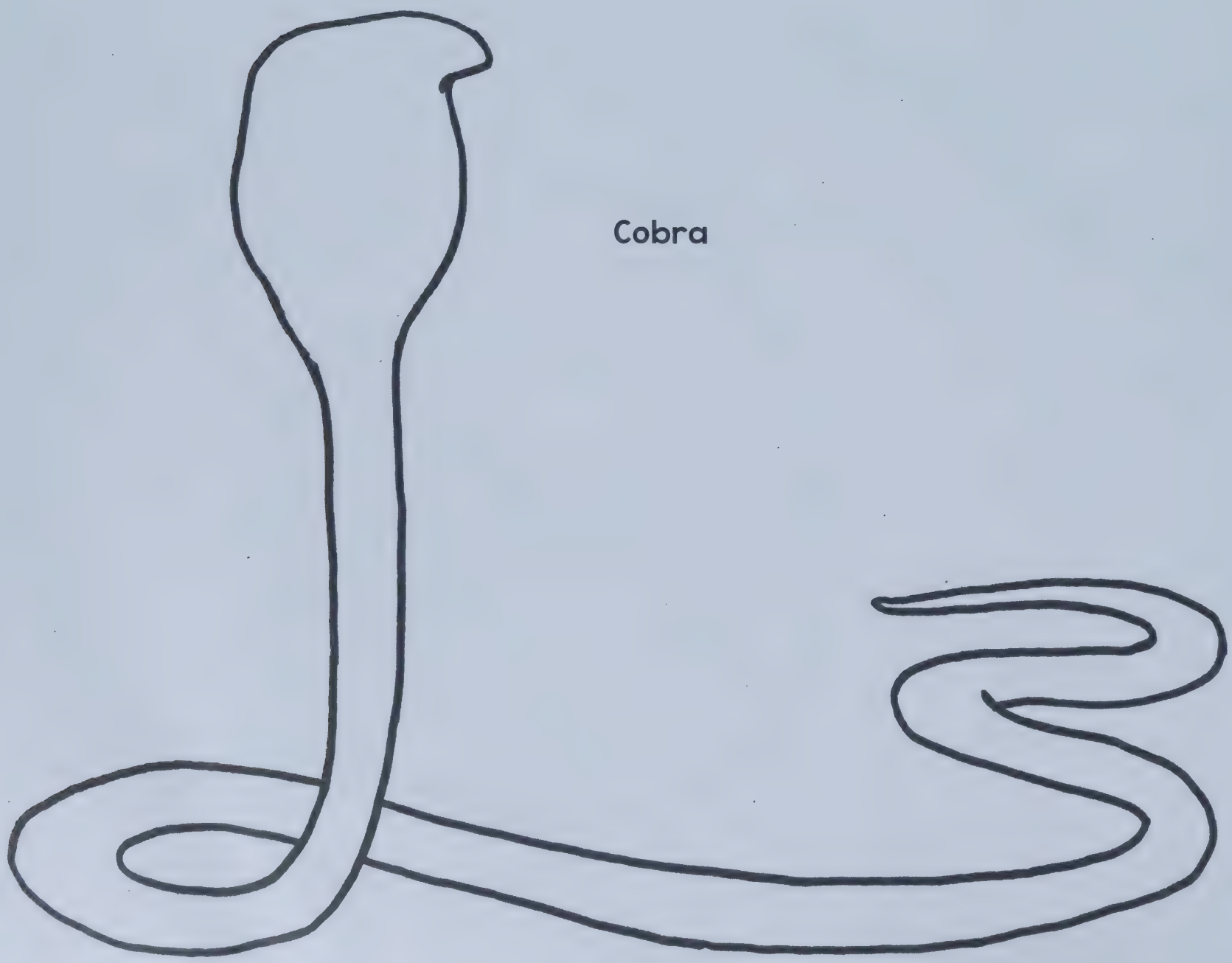
Checkered Keelback



Russell's Viper



Indian Rock Python



Cobra

How can we avoid snake-bites?

It is indeed unfortunate that during many human-snake encounters, one of the two has ended up harming the other.

So how can we minimize these encounters? The fact is that snakes bite only when they are threatened. It is out of an instinct to protect themselves that they attack humans.

» If you have to go out in the dark, always carry a light with you.

» If you are walking in a forest or grassy area, try not to veer off the path. In case it is unavoidable, carry a long bamboo and keep moving the grass in front of you. If there is a snake close by, it will get the vibrations and slither away.

» Try to wear shoes as far as possible.

» Be alert while collecting fodder, harvesting crops, or collecting fruit. Do not straightaway put your hand into any holes of tree trunks, termite mounds, hillsides, burrows etc without ensuring that there is no animal inside.

» Rats are prey of many snakes. Avoid letting rats into your house, as snakes may follow.

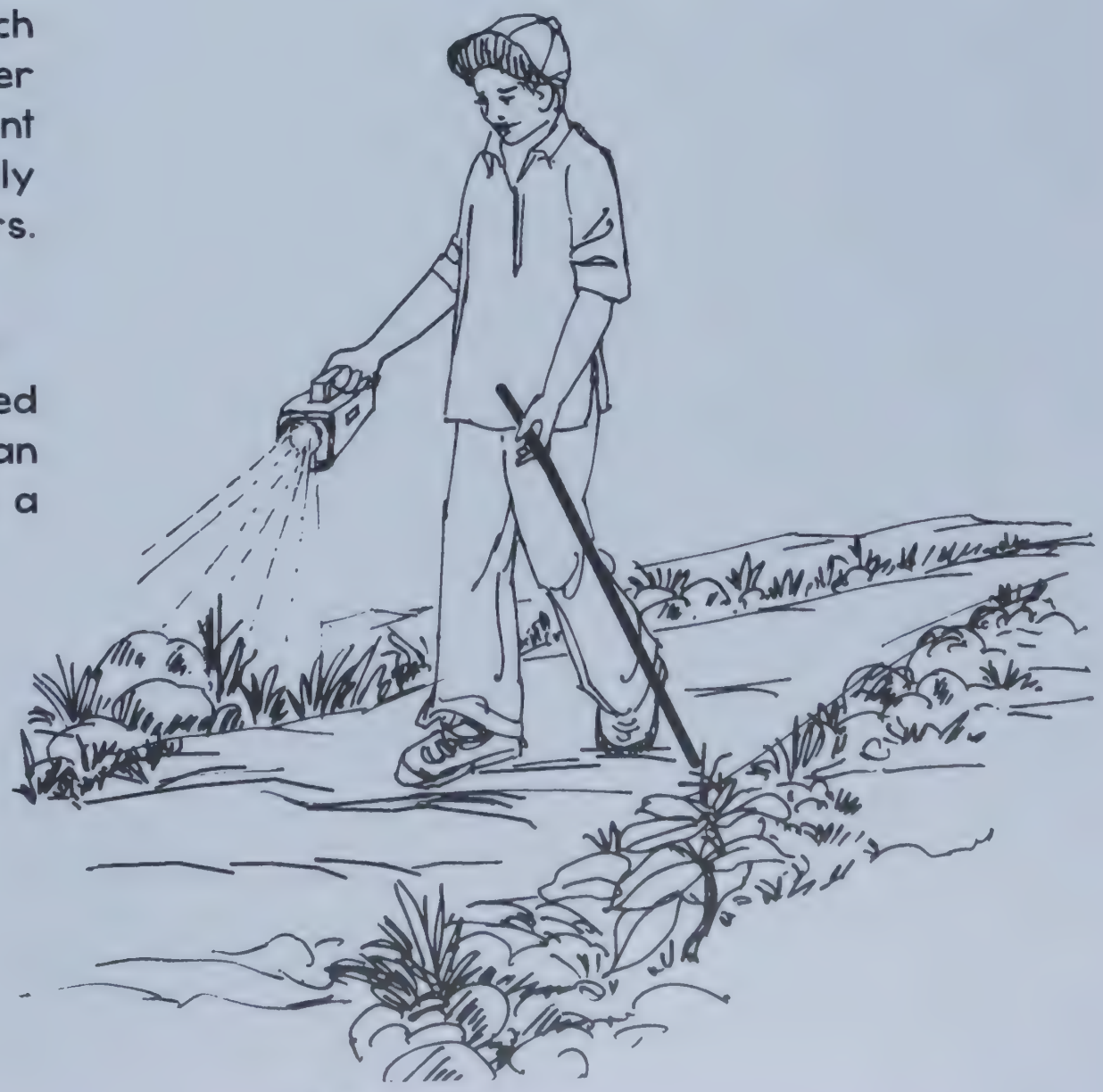
» Take care while disposing off garbage. If it is dumped next to the house, rodents gather to find food, and that could attract snakes.

Snake Safety

Discuss more such measures and remember to share and implement these with your family and community members.

Farmer's Friend

A snake is considered a farmer's friend. Can you guess why? Have a discussion in class.



Lizards

Most lizards have four legs and a long tail. They have an external ear opening unlike other reptiles, so they can hear well. They also have better eyesight than most reptiles.

Lizards eat different kinds of food. Some are carnivores, eating small mammals, birds, and reptiles while others eat leaves, fruits and flowers. Many eat insects like grasshoppers and crickets, grabbing them with their long sticky tongues or catching them with quick bites.

Many lizards live on the ground, while others make their homes in trees, or in burrows. The tree lizards have special toes and often a long and curled tail to help them in grasping thin branches. Lizards such as skinks that live in burrows have smaller legs to help them move underground more smoothly.

Did you know?

Some species of lizards have a unique escape mechanism. When in danger of being caught by a predator, they can detach their tails. The tail keeps wriggling and distracts the predator, as the lizard slinks away unnoticed! This mechanism can also save a lizard if it gets bitten by a snake on the tail. It stops the venom from spreading to the rest of the body. The tail grows back a few weeks later.

Let's look at some of the lizards found around you which come in different sizes, shapes, and colours.

Common Indian Monitor

What does it look like?

Monitor lizards are a group of large and powerful lizards with long necks, strong tails and well-developed legs with claws. What sets them apart from other lizards are their uniform body shape and extremely long forked tongue. When threatened, many species of monitors inhale large amounts of air which makes them appear larger than they actually are.

The common Indian monitor can grow up to 175 cm in length from head to tail. It is olive, grey or brown in colour with a series of dark markings on the neck, throat and back. Unlike most animals, the young ones of this lizard are more colourful than the adults.

What does it eat?

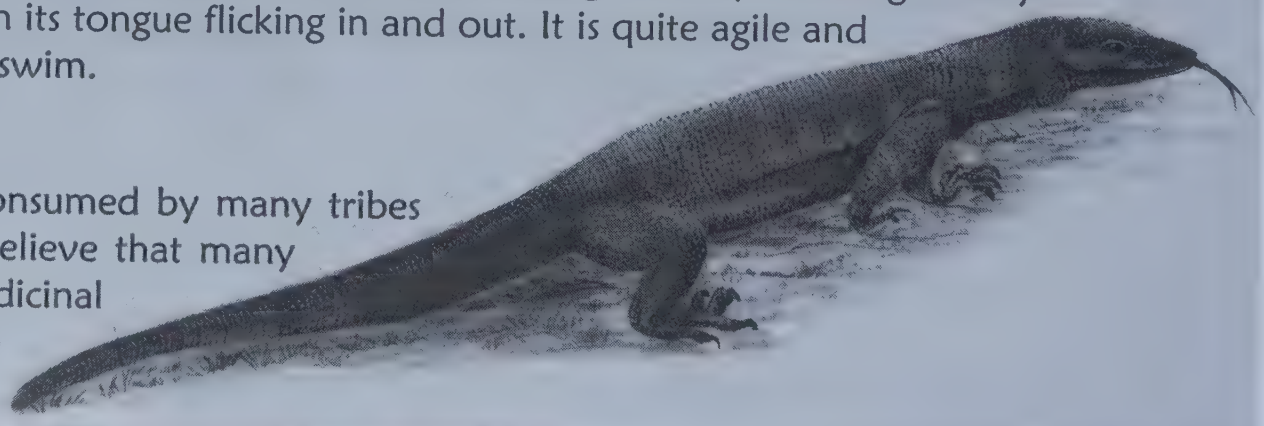
Its normal prey consists of eggs, beetles, scorpions, snails, ants, frogs, fish, lizards, snakes and small mammals. The common Indian monitor, like many other monitors, attempts to intimidate its predators by violently moving its tail from side to side, along with inflating its throat, and creating a hissing sound.

Where can I spot it?

It lives in cracks and crevices in the ground. It hunts during the day, moving slowly across the forest floor with its tongue flicking in and out. It is quite agile and is able to climb as well as swim.

Did you know?

Monitor lizard meat is consumed by many tribes across India. Some also believe that many of its body parts have medicinal value. The skin is used to make leather.



Brahminy Skink

What does it look like?

A skink is a kind of lizard which has no pronounced neck and very short legs. Some skinks have no limbs at all.

The brahminy skink looks like a snake except that it has tiny legs. It is shiny brown, olive or bronze above, and often has dark spots. A yellow band passes from behind each eye to the base of the tail. The underside of its body is white or yellow.

What does it eat?

It is primarily a ground dweller, and actively searches through the leaf litter for prey. It is insectivorous and its typical prey includes flies, crickets, grasshoppers, beetles, and caterpillars.

Where can I spot it?

Most skinks love to dig and burrow and the brahminy skink is no different. It spends its time underground where it is mostly safe from predators, sometimes even digging out tunnels for easy navigation.

Common Garden Lizard

What does it look like?

This lizard is greyish-brown, but colours vary in individuals, and some are even green in the wet season. During the breeding season, males have a blood-red swollen head and upper body.

What does it eat?

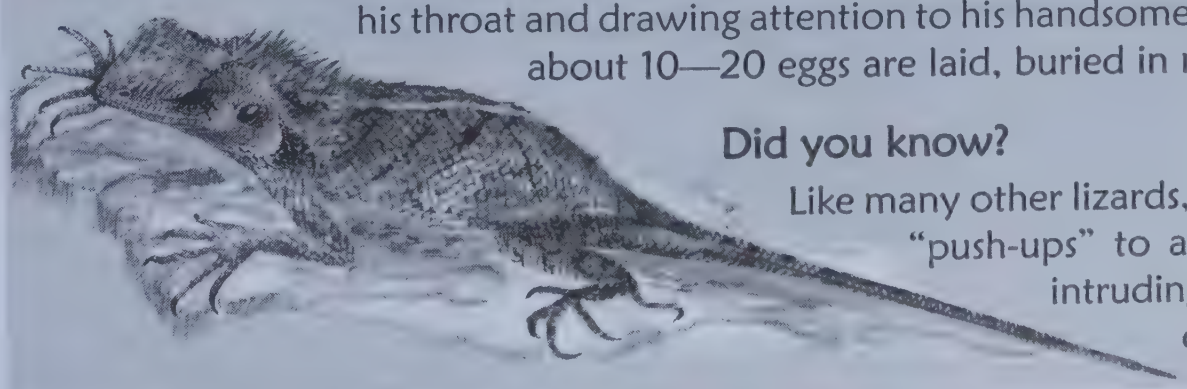
It mainly eats insects and small vertebrates, including rodents and other lizards. Although it has teeth, these are designed for gripping prey and not tearing it up. So prey is swallowed whole. Occasionally, a common garden lizard also consumes vegetable matter.

Where can I spot it?

It is commonly found among the undergrowth in open habitats including highly urban areas.

How does it breed?

The male becomes highly territorial during breeding season. He tries to attract a female by inflating his throat and drawing attention to his handsomely coloured head. After mating, about 10—20 eggs are laid, buried in moist soil.



Did you know?

Like many other lizards, the garden lizard males too do "push-ups" to attract females, and discourage intruding males. How many push-ups can you do?

Quiz Time!

Name :

1. any two venomous snakes and two non-venomous snakes

2. a lizard which has reduced or no limbs

3. a snake which kills by constriction

4. a lizard which impresses the female with his red head

5. a snake that camouflages beautifully amongst leaves and branches

Lizard Maze

How fast can you find your way through this lizard maze?

Plants

Tree Observations

Select any tree around you. Observe and describe it here by choosing the appropriate words from those given. Choose as many words as applicable. (Answer as many as you can. Your answers will depend on the season in which you observe the tree.)

a. Shape: straight crooked umbrella-like sparse dense

b. Size: tall short medium

c. Leaf colour: dark green parrot green yellow red brown

d. Flower (if in season): single clustered not present

e. Flower colour (if in season):

f. Fruit colour (if in season):

g: Fruit shape and size (if in season):

h. Edibility of fruit: yes no don't know

Do you know the name of the tree? Try and find out!

Leaf Descriptions

Get a variety of leaves found around you. Look at the SHAPE of each one carefully. Is it long or short? Does it have a plain EDGE or a serrated one? Is it a single leaf or does it have little LEAFLETS? What is its TEXTURE like? Is it rough, smooth, hairy or sticky? Is it sap-filled? Now note the COLOUR.

Choose any three and draw their outlines in the boxes given. Describe these. Try to find the names of the trees they belong to and write them under your drawings.

Mahua

The *mahua* tree has innumerable uses. Can you write or draw to depict the uses in the circles below? One has been done for you.

Useful Plants

Name some uses of the following plants.

Palash

Bamboo

Tendu

Amla

Banyan

'*Kalpavriksh*' is a wish-fulfilling tree in mythology. Different regions in India have different trees which are believed to be their '*Kalpavriksh*' because it supports people's lives in many ways. Which tree would you call the 'Kalpavriksh' of your region?

One of these is declared the State Tree of Madhya Pradesh. Can you guess and circle it?

Tendu Bark

You can spot a *tendu* from a fair distance just because of the unique pattern of its bark! Can you draw the *tendu* bark in the square below?

Bark Etchings

Go out with a paper and a crayon. Choose a tree which has an interesting pattern on its bark. Place the sheet on the bark and rub the crayon on it. The pattern of the bark will get etched onto the sheet. Can you describe the bark, its colour and texture?

Trees and Animals

Choose a tree near your house or school and note its name here. Make a list of all the creatures that the the tree supports. You could look for the creatures themselves or for clues such as nests of birds, webs of spiders, and so on. Look inside hollows and on branches as well. (If you don't know a name, describe the animal briefly.) Keep going back to the same tree at different times of the day and in different seasons to make your list.

Ecosystems

What are ecosystems?

Think about the forest around or near where you live. What are the different animals, big and small, that you can find? Do they live on land, or on trees, or near water? What are the plants that grow in these forests? Are there trees, shrubs, climbers and herbs? What is the colour and texture of the soil? Does it rain a lot? Do the temperatures vary a lot in different seasons?

Now think about a grassland and answer the same questions. You could also think of an ocean, or a hot desert. How different are your answers? Would you agree that life on Earth exists in areas that have different types of soils, different amounts of water, air and light, different temperatures, etc?

The plants and animals here have adapted to living with each other and to their surroundings. The living organisms that you would find in an area, like a forest, or a desert for example, partly depend on the non-living factors found there (temperature, humidity, rainfall, sunlight, etc). These living organisms interact with each other and with these non-living components to survive, grow and reproduce. The term that is used to describe these relationships in an area is "ecosystem".

Forests, grasslands, deserts, marine areas are all different kinds of ecosystems. Each of these has specific types of vegetation and specific kinds of animals. Ecosystems can be spread over vast landscapes, like hot or cold deserts, forests or oceans, or they can be formed in a small area, like a pond.

Some plants and animals are found only in certain ecosystems, whereas some others are found across different kinds of ecosystems. For instance, camels are found only in deserts but pigeons or mynahs may be found in varied ecosystems.

Where am I found?

There are some species which are found only in certain ecosystems, whereas some are found across several. From the following list, match the species with the ecosystem where it is most likely to be found.

(lark, kingfisher, mango, camel, dolphin, cactus, wolf, duck, chital, seaweed)

Grassland

Forest

Lake

Ocean

Hot Desert

What are food chains?

In any given ecosystem, the animals depend on plants for their food, either directly, or indirectly. In a forest, a deer eats grass, and a tiger, in turn, eats the deer, forming a kind of sequence. This sequence is called a food chain; the grass, the deer and the tiger, each forming a link of that chain. Many such food chains exist in the forest.

Herbivores are animals that eat only plants (for example - deer, langur), while carnivores are those that eat only animals (for example - tigers, leopards). However, there are animals like peafowl and wild boars that eat both animals and plants and they are called omnivores.

A carnivore such as a leopard may hunt several animals, such as wild boar, sambar, or chital. A herbivore such as a deer may be preyed upon by various predators such as wild dogs, leopards and even crocodiles. Any ecosystem has more herbivores than carnivores.

Prey or Predator or Both?

In food chains, there are many animals that play the role of both, prey and predator. For example, a snake eats a rat, but also gets eaten by an eagle. Can you name any more such animals?

Herbivore, Carnivore, Omnivore

In the pictures below, put a circle around the herbivores, a triangle around the carnivores and a square around the omnivores.

Links of a Chain

Complete the following food chains by filling in the missing links.

1. _____ eats FROG eats _____

2. LEOPARD eats _____ eats GRASS

3. _____ eats SNAKE eats RAT

Our Forest Ecosystem

A forest is home to several lakhs of microscopic animals, insects, reptiles, birds and mammals. Various plants ranging from mosses and lichens, to creepers, climbers, shrubs, and trees all thrive in this ecosystem. As these plants and animals die and decompose, the soil becomes very rich in nutrients. When seeds fall off from trees, they get embedded in this rich soil and germinate into small saplings. When they get sufficient sunshine and rain, these saplings grow into large trees.

This vast and dynamic forest provides us with many goods and services.

» The forest floor acts as a sponge, which holds rainwater and releases it slowly, thereby replenishing the rivers and streams that flow through it.

» The roots of the trees hold the soil together and prevent it from getting eroded by wind or water.

» Today, there is a marked increase in the amount of carbon dioxide in the atmosphere, causing a variety of threats to the planet. Trees use up carbon dioxide to produce their food, and lock up large amounts of carbon in their wood.

» The water vapour which is released by trees adds to the humidity in the atmosphere, and helps in cloud formation, which eventually turns into rain.

Treasures of the Forest

Do you go to the forest to collect anything? List some goods that the forest gives you.

Central India has a mix of dry and moist deciduous forests, and grasslands. Deciduous trees are ones which shed their leaves in the dry season. The typical trees found here are *sal*, mango, *jamun*, *palash* and *khair*, interspersed with bamboo thickets.

Creatures of the Forest

How many creatures can you spot here? There are 5 plant species and 9 animal species hidden in this forest! Can you find them all and identify them?

1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

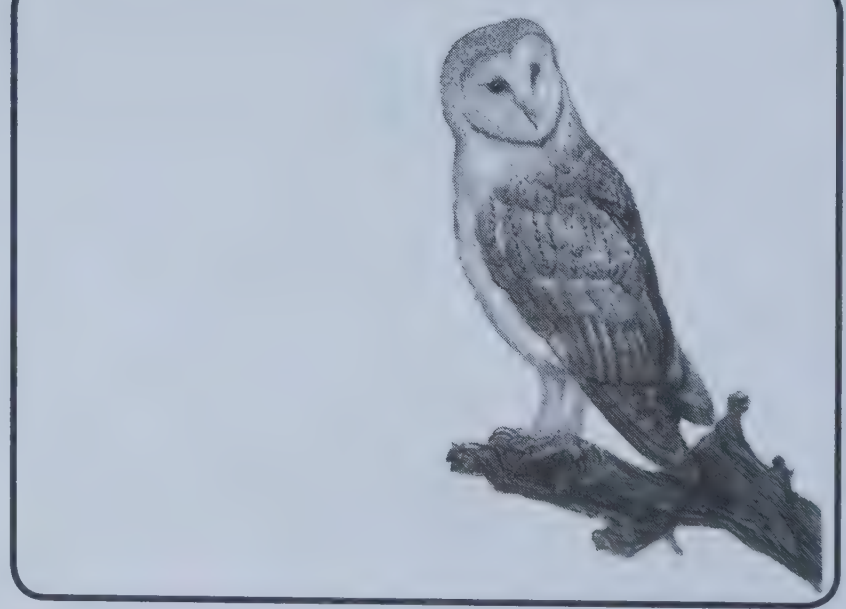
7. _____ 8. _____ 9. _____

10. _____ 11. _____ 12. _____

13. _____ 14. _____

Suns and Moons

Some animals are active during the day, while others are active at night. Look at the animals below. When do you think they hunt or forage? Draw a sun in each box with a day creature and a moon in each box with a night creature.



Shadow Art

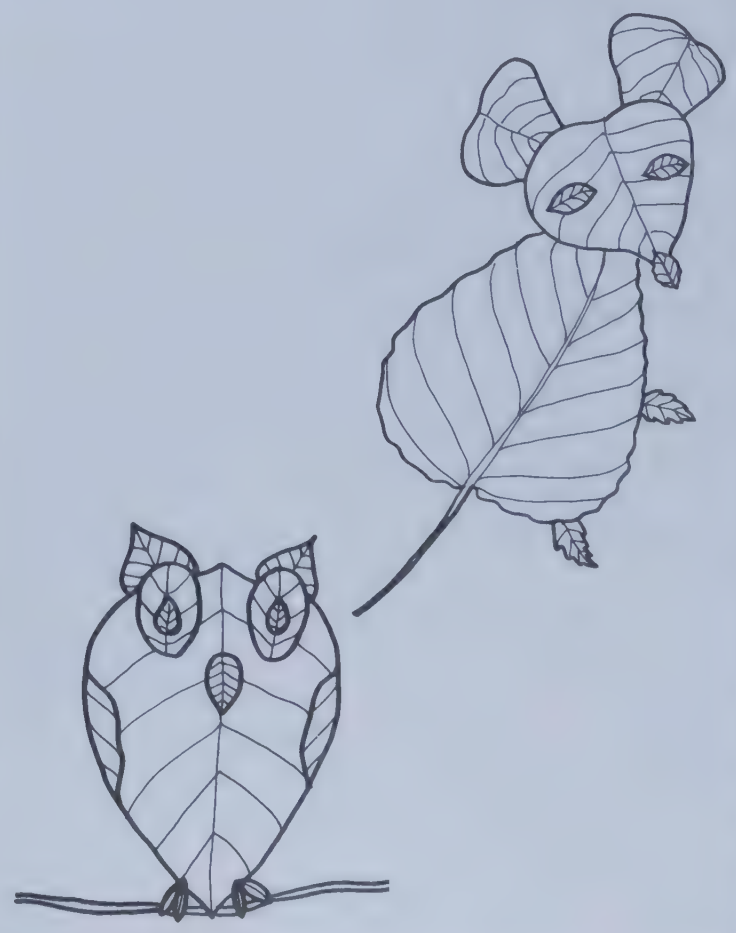
Use a candle to create shadows on the wall. See how many different animals you can create.

Thumbprint Animals

Paint with your fingers! Dip your thumb or finger into a paint of your choice and make imprints on paper. Use a pen to turn the fingerprint into an animal figure.

Leaf Zoo

Create a leaf zoo! Collect leaves of different shapes and sizes. Stick them on paper to make animal shapes.



Word Search

There are names of 19 species hidden in this grid. Find them and circle each one. Clues are given below. The first one is done for you. You can read both horizontally and vertically.

S B T A F B A N Y A N

N A V U L T U R E M I

P R C H Y E N A I O L

A B A H C O B R A N G

L E O P A R D M A I A

A T J J T K R A I T I

T I U A C A O R Q O M

E G V C H I N K A R A

N E A K E E G R E T H

D R B A R N O W L I U

U W I L D D O G Z W A

1. A nocturnal bird with a heart shaped face
2. A mammal whose male is bluish grey
3. A hooded snake
4. A mammal that scavenges
5. Asian paradise _____
6. A mammal that is bigger than a fox but smaller than a wolf
7. A venomous snake with milky white bands
8. A buffalo's friend: cattle _____
9. A "royal" mammal
10. A large and powerful lizard
11. A tree with many uses for humans
12. A bald scavenging bird
13. A tree with a distinct pattern on its bark
14. A carnivorous, spotted mammal
15. A mammal that "sneezes"
16. A bird that mimics the calls of others
17. A bird that sounds like a coppersmith
18. A mammal that hunts in packs
19. A tree with hanging roots

Forests and Humans

Throughout history, humans have had a very complex relationship with the forest. Some have seen it as a place of picturesque beauty, while others as a brutal and dangerous region, worthy of fear. Some, as a place to hunt for pleasure, while others as a nurturing land that provides resources for survival. Many have called it home.

Centuries ago, India was covered in lush green forests and grasslands that were home to a large number of birds, mammals and other creatures. People hunted them for food as well as for sport. Kings, princes, Mogul and British rulers would hunt large numbers of animals and bring them back as trophies. Slowly, over time, the population of wild animals started decreasing, to the extent that some became completely extinct.

Did you know?

The Cheetah is the fastest animal in the world. It can run at a speed of more than 100kph! The Mogul kings used to capture and train Cheetahs to hunt for them. Cheetahs couldn't be bred in captivity. This contributed to the decrease of their population. The remaining ones were hunted down. The last Cheetah of India was shot dead in 1950, making the animal extinct in India.

As human population and its needs grew, more and more forest was destroyed to make way for villages, towns, agriculture and industry. Many animals, that were dependent on the forest, slowly reduced in number.

Forest History

Ask a grandparent or a village elder about what the forest looked like 50 years ago. Was it any different? Did they see animals that they don't get to see very often now?

Though animals have been hunted and have had their habitats destroyed throughout history, today, wildlife faces even more threats than before. What are these threats?

Threats to the Forest and its Wildlife

Development and Habitat Destruction

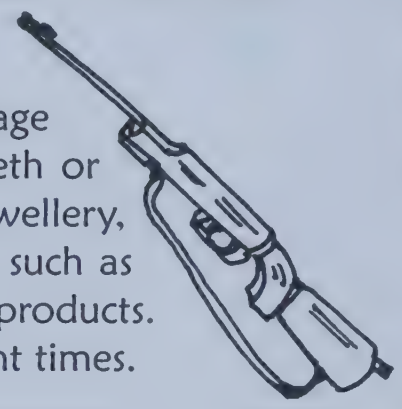
Each species requires a certain kind of habitat in order to flourish. With more and more forest being destroyed to make way for roads, buildings, large dams and industries, wildlife habitat is being lost.

Mining

Many forests are rich sources of minerals such as coal, iron and bauxite. Humans dig these out for their use. This is called mining. Mining not only causes deforestation but also pollutes streams and groundwater.

Poaching

Poaching is the illegal hunting, killing or capturing of animals. People engage in poaching to earn from products such as animal skin, nails, bones, teeth or horns. These are sold by poachers to people who use them in clothes, jewellery, medicines or as decorations or lucky charms. Thousands of wild animals such as tigers, leopards, deer, crocodiles have been killed in our country for these products. Poaching has drastically reduced the populations of certain species in recent times.

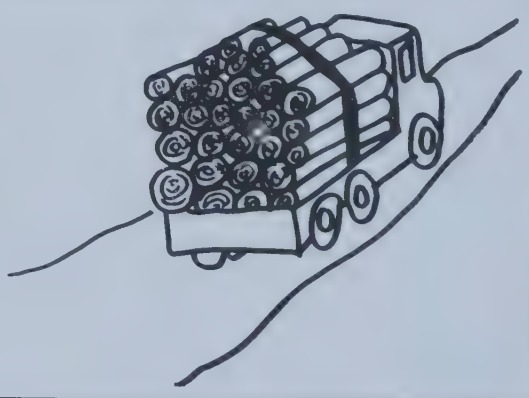


Climate Change

People burn fuel every day, in industries, in homes, for transportation, and various other reasons. This produces gases that trap heat into the atmosphere, changing the temperature and hence the seasons, the rainfall and the overall climate. Some animals are especially sensitive to small changes in climate and their populations are severely affected.

Population and Forest Resources

The population in our country has grown four times in the last 150 years! Large amounts of timber are extracted from forests for urban needs. Some forest communities are also dependent on forest products such as wood, fruits, vegetables, herbs, resins, tree barks, flowers and more, for their livelihoods as well as their daily needs. Uncontrolled extraction of these causes harm to the forest.



Pesticides in Agriculture

Increasing human population requires increasing amount of land for agriculture. Moreover, farmers have started using poisonous pesticides which are destructive to many plants and animals.

Monoplantations

Monoplantation refers to planting of a single species of crop or plant in a large area. This is increasingly being done for commercial purposes. It causes certain animal species to flourish and others to perish, disturbing the balance in nature.

Human Wildlife Conflict

Rise in population also means that humans and wildlife are invariably competing for space. There are often cases when a leopard or another predator wanders into a village and kills cattle or even people. Some animals also raid fields and destroy crops. Humans then retaliate by killing off the troublesome animals.

Myths about Animals

There are many myths and stories surrounding animals, among the people living around forests. While some beliefs help in protecting forest patches or animals, others can cause harm. Snakes, lizards and birds are often killed out of fear or out of the belief that killing them will bring luck.

Forest Fires

Forest fires can occur naturally. But they are often caused by humans, either accidentally or intentionally, to clear land for agriculture and fodder, or to facilitate the collection of forest produce. When not controlled, these fires can spread to huge areas destroying wildlife habitat and producing harmful gases.

Invasive Species

Invasive species are those which were not originally found in an area, but were introduced by humans. Some of these can grow and spread rapidly and do not let native species grow, severely damaging the ecosystem.

What is conservation?

With so many threats to wildlife, there is significant reduction in the population of many animals. What will happen to them if these threats continue? What will happen to the forests and the people dependant on it? What will happen to the air that we breathe? How will our future generations survive? We can't even begin to imagine all the implications! Conservation is the practice of protecting wild plants and animals and their habitat.

Conservation is not a new concept. Many of our ancestors realised its importance and made efforts towards protecting our natural wealth. Kings and rulers made laws to safeguard nature. One well-known example is that of King Ashok, whose edicts advocated respect towards animals.

Many forest dwelling communities led a lifestyle which was in harmony with nature. One of the ways of conservation was the practice of protecting sacred spaces and elements. "Sacred groves" were patches of forest protected by communities. They were associated with certain deities that the communities believed resided there. Hunting and logging was generally prohibited, and if it happened at all, it was after following intricate religious rituals. Since sacred groves remained untouched for centuries, they survive today as patches of pristine forest. Sacred spaces are not limited to forests. They also include lakes, mountains, islands, marine stretches, mangroves, grasslands and nearly every other kind of ecosystem. In addition, some species of plants and animals are also considered sacred.

Gond

The Gond Tribe is the largest tribe in Central India. Like many other Indian tribes, they have deep-rooted traditions of nature worship. Every Gond clan has its own deity or totem, which is quite often a plant or animal. The people regard themselves as related to or descended from that totem species and do not injure or hunt it. Some examples of totem species are *sal*, mango, nilgai, buffalo, tortoise, snake and fish. Apart from totem species, many others such as *mahua*, bamboo and neem also have religious importance. The Gonds also have intricate traditional systems to ensure that resources from the forests are not overharvested.

Traditional Practices

Till today, over 600 different tribes in India practice conservation in different ways. For instance, some tribes do not hunt pregnant animals, some do not chop trees that support many life-forms, some have specific ways of chopping trees, to ensure that they grow back. Do you know of any such traditional conservation practice followed by your community? Write it here. In case you are not aware, ask your village elders to find out.

Conservation Today

The Indian government has enacted many laws to protect wildlife and natural resources in our country.

The Wildlife Protection Act was established in 1972. The law prohibits damaging, hunting, capturing or injuring most species of wild plants and animals in India. Under this law, large areas are demarcated for wildlife protection. These include sanctuaries, national parks, conservation reserves and community reserves. Another kind of protected area is a tiger reserve. Tiger reserves are governed by 'Project Tiger', that was launched by the government in 1973 with the objective of protecting the tiger population of India. As of 2014, there are 48 tiger reserves in India. Bandhavgarh, Kanha, Panna, Pench and Melghat are some of the tiger reserves located in Central India.

The Biological Diversity Act of 2002 regulates the use of biological resources of India. Under this law, Biodiversity Heritage Sites are created to protect areas of high biological diversity. Also, villages are expected to form committees that keep records of the biodiversity found in their area.

The Forest Rights Act was established in 2006 to recognise and protect the rights of forest dwellers. Under this Act, *gram sabhas* decide on issues related to ownership of land, management of forests and usage of forest resources.

Baiga

Baiga, traditionally a hunter-gatherer tribe of Central India, was renowned for its knowledge of medicinal plants, forest-based rituals and rules of conservation. The forests played a huge role in their cultural practices, livelihoods and economy. But this changed...

Have you ever wondered why there are so many *sal* trees in the forests of Central India? When the British began to rule India, they wanted to encourage the growth of *sal* trees in Madhya Pradesh as these were good sources of timber. So, they gradually cleared off many native species, to allow *sal* trees to flourish. The Indian Forest Department continued to follow this approach and did away with some plants such as *mahuli*, *kayafal* and lianas that were important for local wildlife and people.

However, in more recent times, the Baigas have been making efforts to regain their lost ways and to regenerate their forests. They have planted bamboo and other species through voluntary labour. When the Forest Department wanted to cut trees for timber, the people of some villages like Dhaba and Ranjra opposed it by physically preventing labourers from cutting trees and, in some cases, even seizing their axes and saws! Despite threats of police action, *gram sabhas* managed to protect their forest from these operations. They also passed resolutions stating that the Forest Department needed to get consent of the villagers before cutting any trees.

In addition to protected areas declared by the government, there are thousands of areas in India, where communities are either carrying on age old practices of regulated use, management of resources and protection of species and habitats, or have evolved such systems in recent times for a variety of reasons. Such areas are known as community conserved areas. Many of these are now gaining international recognition.

Many NGOs, organisations and individuals, too, are striving to protect our forests and its wildlife. People also undertake research to gain a deeper understanding of different species and their needs.

Make a Map

Map your village and its surrounding forest, showing rivers, local deities, important trees, and areas significant for wild animals.

What can we do?

Conservation also happens at an individual level. Each of us can contribute, for instance, by planting native trees, such as *mahua*, *tendu*, *amla* or *chiraunji*. The saplings of these can be obtained from the Forest Department. We can also help by reducing contact with wild animals as far as possible. Staying away from forests at night is one way of ensuring this. In case a wild animal has entered the village area, informing the nearest forest *chowki* will help in dealing with the situation. Trying to chase away the animal may provoke it to attack. The nearest patrolling camp or forest *chowki* can be contacted in case you come across any illegal activity such as poaching, or setting up of snares, or sale of wildlife products like skins, claws, horns, bones and so on. Learning local history from your elders can be a good way of knowing about traditional conservation practices. One can also contribute by keeping updated about conservation issues and volunteering with organisations working for that cause.

My Forest and Me

Now that you've learnt a lot more about the forest, draw your forest here and write a few sentences on what you will do in order to protect it.

Answers

Size Problem 10

Myna - bigger than a bulbul but smaller than a pigeon

Village Hen - about as big as a kite

Partridge - about as big as a pigeon

Peafowl - bigger than a vulture

Tricks with Beaks 13

1-b, 2-c, 3-c, 4-a, 5-c, 6-b

How Do I Move? 15

a) wading near water b) swimming c) running d) grasping prey e) perching on a tree

feet of duck - b

Farmer's Friends 16

Sample Answers: 1) a barn owl because it eats rats which destroy the crops 2) an earthworm because it aerates the soil

Mimic a Bird 23

Pigeon - *coo coo coo coo*

Peafowl - *keeeaaaww*

Jungle Babbler - *kekekekeke*

Crow - *caw caw caw*

Crested Hawk Eagle - *ki ki ki ki keeah*

Where do I Live? 24

crested lark - grassland, rose-ringed parakeet - fruit tree, pond heron - lake

Migration 25

Pintail

Maze 26

pigeon - grain, bee-eater - insect, pelican - fish

Letter Jumble 27

1. golden oriole, 2. nightjar, 3. indian roller, 4. vulture, 5. cattle egret, 6. jungle babbler

Quiz Time 27

(Sample Answers)

Birds that have crests - crested hawk eagle, peafowl, jungle fowl, Asian paradise flycatcher

Birds that are mainly green - bee-eater, coppersmith barbet, yellow-footed green pigeon, rose-ringed parakeet

Birds that nest in tree cavities - grey hornbill, owl, barbet

Birds that eat insects – cattle egret, drongo, nightjar, bee-eater

Birds that eat fruit – grey hornbill, coppersmith barbet, yellow-footed green pigeon, rose-ringed parakeet

Antlers and Horns 32

a) chinkara, b) barking deer, c) chowsingha, d) nilgai, e) sambar, f) chital

Letter Jumble 36

1) chinkara, 2) leopard, 3) mongoose, 4) porcupine, 5) sambar

Footprints 38

a) sambar, b) hyena, c) mongoose, d) wild boar, e) tiger

Stripes 39

a & d

Colour and Identify 42

common jezebel

Hiding in Plain Sight 43

stick insect, leaf insect, atlas moth

Reptile or Not? 47

reptiles - tortoise, monitor lizard, crocodile, snake

Quiz Time 56

(Sample Answers) 1. venemous - cobra, krait, non-venemous - Indian rock python, vine snake, 2. skink, 3. rock python, 4. common garden lizard, 5. vine snake

Useful Plants 60

State Tree of Madhya Pradesh - Banyan

Where Am I Found? 63

grassland – lark, wolf, forest – mango, chital, lake – duck, kingfisher, ocean – dolphin, seaweed, hot desert – camel, cactus

Creatures of the Forest 67

bamboo, *sal*, *mahua*, *tendu*, *amla*, golden oriole, vine snake, chital, vulture, grey langur, grey hornbill, wolf, common garden lizard, common crow butterfly

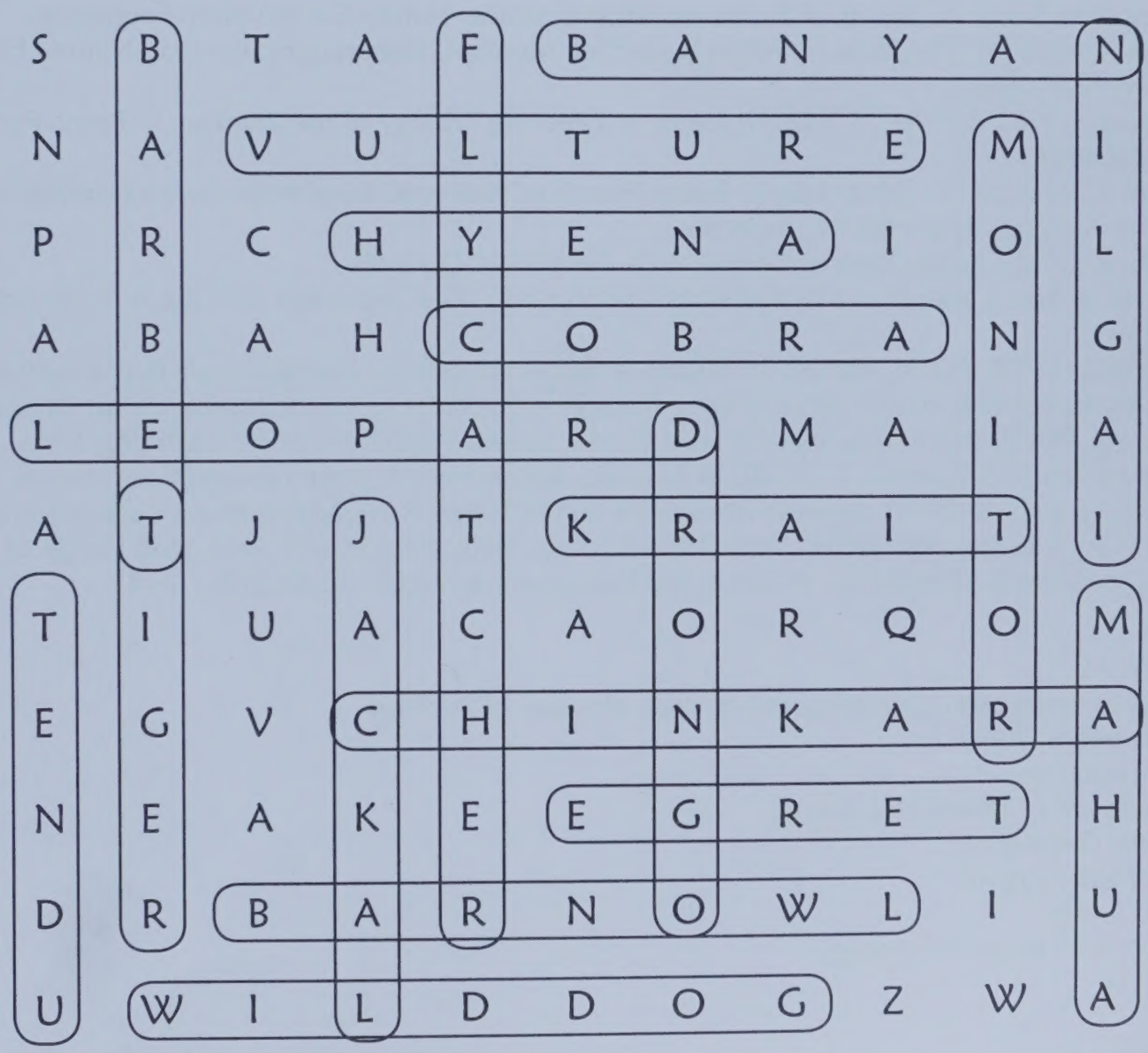
Suns and Moons 68

Suns - nilgai, butterfly, kingfisher

Moons - porcupine, hyena, barn owl

Word Search 70

1) barn owl 2) nilgai 3) cobra 4) hyena 5) flycatcher 6) jackal 7) krait 8) egret 9) tiger 10) monitor 11) *mahua* 12) vulture 13) *tendu* 14) leopard 15) chinkara 16) drongo 17) barbet 18) wild dog 19) banyan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ISBN 9788187945697

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